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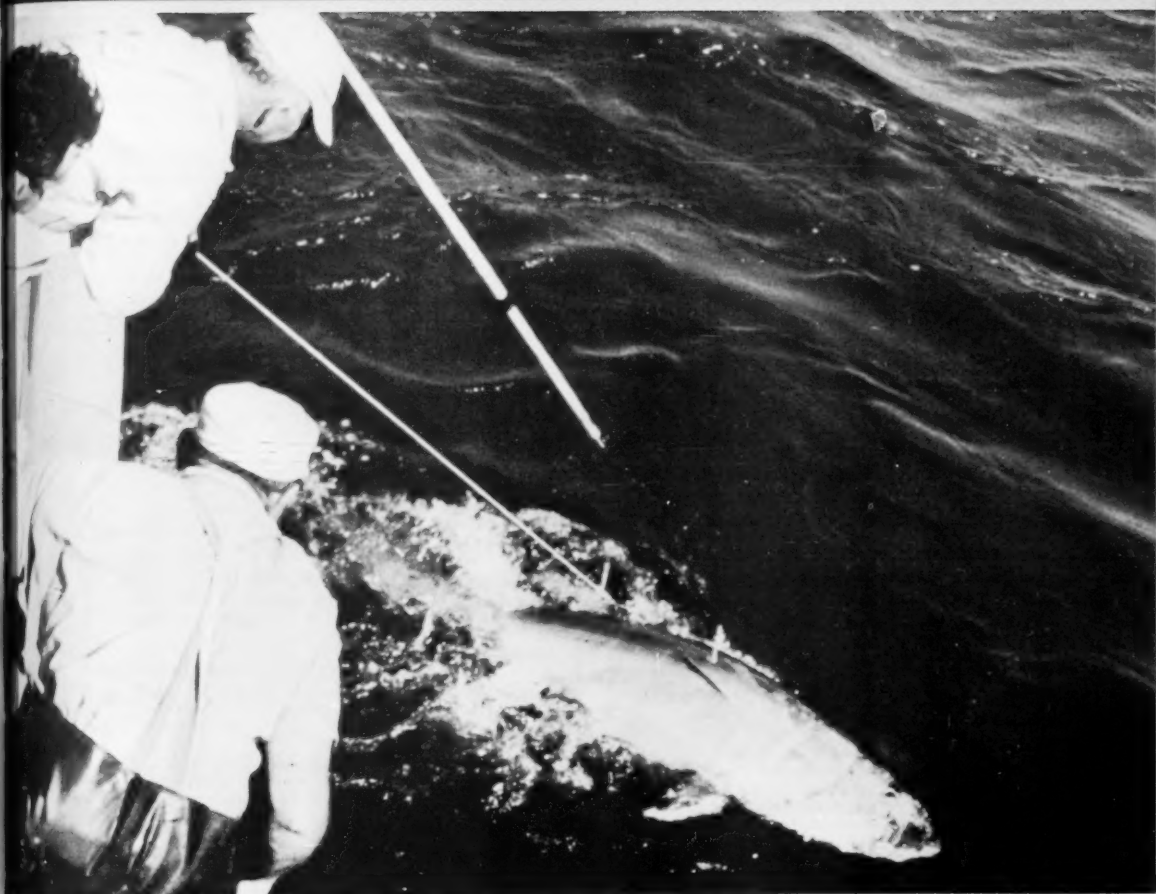
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COMMERCIAL FISHERIES REVIEW

THE UNIVERSITY
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VOL. 24, NO. 2

FEBRUARY 1962

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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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BLUEFIN TUNA CONCENTRATION FOUND DURING A LONG-LINE EXPLORATION OF THE NORTHWESTERN ATLANTIC SLOPE^{1/}

By Frank J. Mather III* and Martin R. Bartlett*

ABSTRACT

Fourteen exploratory long-line sets (totaling 5,220 hooks) were made in November 1960 in or near the slope water between Cape Hatteras, North Carolina, and the Nova Scotia Banks. This area had not previously been explored for large pelagic fish in that season. Tunas caught included 355 bluefin tuna (*Thunnus thynnus*) and 33 of other species (23 albacore, *T. alalunga*, 3 yellowfin tuna, *T. albacares*, 1 blackfin tuna, *T. atlanticus*, and 6 big-eyed tuna, *T. obesus*). Other fish taken were 2 swordfish (*Xiphias gladius*), 1 opah (*Lampris regius*), 34 lancetfish (*Alepisaurus ferox* and *A. brevirostris*), and 133 sharks (44 blue shark *Prionace glauca*, 2 mako *Isurus oxyrinchus*, 75 porbeagle *Lamna nasus*, 8 silky shark, *Carcharhinus floridanus* (or sickle shark, *C. falciformis*), and 4 hammerhead shark *Sphyrna* sp. or spp.). Most of the bluefin tuna were taken at 4 localities along the 1,000-fathom curve from Hudson Canyon (39°16' N., 71°53' W.) to Lydonia Canyon (40°03' N., 67°37' W.). The catch rates of from 9 to 58 tuna per 100 hooks at those stations indicated an exceptionally dense concentration, while no more than 2 tuna were taken per 100 hooks at any of the other stations. Bathythermograms, surface salinities, and other environmental data were taken at each station.

INTRODUCTION

The objective of cruise 56 of R/V Crawford in November 1960, was to determine, by long-line fishing, the distribution of tuna and other large fish in the waters between the 100-fathom curve and the Gulf Stream, from Cape Hatteras to the Nova Scotia Banks. This information was needed for a continuing study of the biology of the larger pelagic fish of the western North Atlantic in general, and of the bluefin tuna (*Thunnus thynnus*) in particular. The trip also provided a continuation of the long-line exploration of that area by the M/V Delaware of the U. S. Bureau of Commercial Fisheries (Squire, in press).

The Delaware surveys have covered much of the northwestern Atlantic, usually including all or most of the above area and often extending much farther to the south and east, in mid-winter (Cruise 59-1, Anonymous 1959a), during the late winter, spring, and early summer (cruises 57-3, 57-5, 58-2, 59-6, and 60-6, Anonymous 1957a, 1957b, 1958b, 1959b, and 1960b), and also during the summer and early fall (cruises 57-8, 58-3, Anonymous 1958a and 1958c). No observations were

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Fig. 1 - R/V Crawford at sea. The 125-foot former Coast Guard cutter (which made 8 transatlantic hydrographic sections during the International Geophysical Year and has been used mainly for hydrographic and productivity studies) by late 1961 had completed 2 major exploratory fishing cruises in the western North Atlantic.

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made, however, between mid-October and mid-January. Those explorations showed that, from January well into June, bluefin tuna were present in the region mainly north of $36^{\circ}30' N$. and east of $70^{\circ} W$. Most of those taken were of medium size, weighing from 60 to 275 pounds, except in June, when several very large individuals were caught. During the summer and early fall, however, bluefin tuna catches were limited to a very few fish taken near the 1,000-fathom curve. This suggests strongly that in June and early July nearly all of them move on to the continental shelf between Cape Hatteras and Newfoundland, where they are found in numbers from mid-June to mid-October (Murray 1952, 1953, 1954, Squire 1959). The Delaware surveys showed, moreover, that yellowfin tuna (*T. albacares*) were present in the warmer waters of the area through much of the year, moving into the slope water as it warms up in the summer and out of it as it cools in the fall, and that the albacore (*T. alalunga*) and the big-eyed tuna (*T. obesus*) occurred in small numbers over much of the area through most of the year.

A similar program of exploratory long-line fishing by the M/V Oregon of the U. S. Bureau of Commercial Fisheries covered much of the Gulf of Mexico throughout the year (Bullis and Captiva 1955, Wathne 1959, and Anonymous 1960a). Those surveys and some commercial fishing (Harvey R. Bullis, Jr., personal communication) revealed the presence of giant bluefin tuna in the Gulf of Mexico from January into June, and in the northwestern Caribbean (Bullis and Mather 1956) in April, but none were taken during the summer or fall. Likewise, extensive investigations of the inshore sport and commercial fisheries have produced very few positive records of the species for November or December.



Fig. 2 - Setting long-line fishing gear from R/V Crawford. The men handle the main and branch lines, tie the tubs of line together, attach the floats and float lines, and bait the hooks. A typical setting and recovery of a seven-mile line of 500 hooks commences at dawn and takes approximately ten hours.

tents. In addition, we intended to gather as much environmental data as possible. The original plan called for a set of stations along the 1,000-fathom curve, another set just north of or in the Gulf Stream, and a third between the two.

METHODS AND EQUIPMENT

Fishing was conducted with standard 10-hook basket nylon long-line gear (Bullis and Captiva 1955) loaned to us, along with a hauler and other equipment, by the U. S. Bureau of Commercial Fisheries, Gloucester, Mass. Atlantic herring (*Clupea harengus harengus*), most of which was also furnished by the U. S. Bureau of Commercial Fisheries, was used almost exclusively for bait. Thirty to 50 baskets were usually set at each station, although at 2 only 20 and 17 baskets, respectively, were fished. Most of the float lines were from 10 to 18 fathoms long, allowing the hooks to fish from about 15 to 60 fathoms below the surface. On several sets, a few 30-fathom float lines were used, and they were attached at alternate rather than consecutive connections between baskets, permitting some hooks to fish at depths

Crawford Cruise 56 was designed to fill the seasonal gap in the Delaware program, and especially to determine the whereabouts of the bluefin tuna in November and to learn as much as possible about its migratory routes from its summer grounds on the continental shelf to its extensive wintering areas. Secondary objectives were to mark as many tunas as possible as part of a continuing gamefish tagging program (Mather 1960), and to obtain material for general biological studies, including meristics and morphometrics, length frequencies, seasonal variations of body proportions and gonad condition, and stomach con-

perhaps exceeding 100 fathoms. The bait from each day's fishing was usually saved and used to chum the line on the following day. Plankton was gathered at the level of the shallower hooks by fastening a 1-meter No. 2 mesh ring net to the windward end of the line, suspended by a 15-fathom float line. This arrangement, which was first used by Francis Captiva of the U. S. Bureau of Commercial Fisheries aboard the *Oregon*, not only collects plankton in an undamaged condition but also keeps the windward end of the line straight. Long-line fishing was supplemented by trolling feather and nylon lures on heavy hand lines during the daylight hours as circumstances permitted. In addition to the usual meteorological observations, bathythermograms and salinity samples were taken at least once at each end of the line, the water transparency was measured with a Secchi disk, and subsurface scattering layers were investigated with a precision graphical recorder.

OPERATIONS

Fourteen long-line sets (totaling 5,220 hooks) made between Cape Hatteras and the Nova Scotia Banks (fig. 3) produced 382 tuna and about 165 other fish (table 1). Over 200 of the tuna, mostly bluefin, were marked with dart tags (Mather 1960). The very heavy catches of bluefin tuna at stations 1 and 6 and the very poor results further south at stations 2-5, and

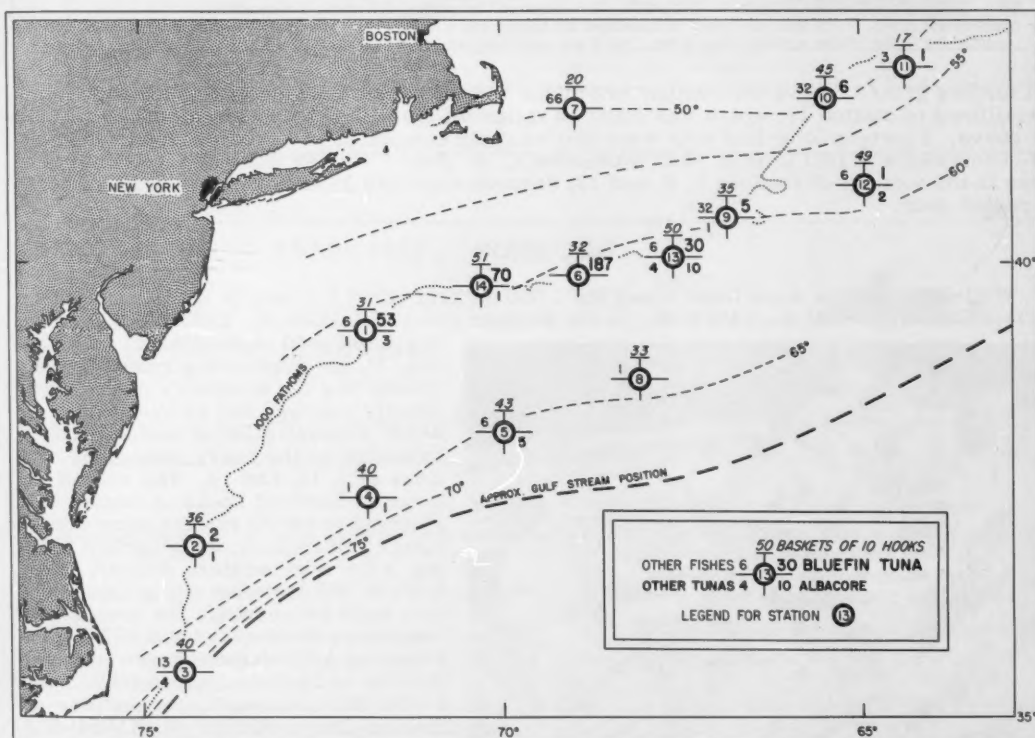


Fig. 3 - Locations of long-line stations occupied during R/V *Crawford* cruise 56, with the number of 10-hook baskets set and the catches of bluefin tuna, albacore, other tuna, and fish of other species for each. Isotherms ($^{\circ}\text{F}$.) are based on the means of observation at stations only. More detailed environmental and other data are available at the Woods Hole Oceanographic Institution.

later, at station 8, led to a revision of the original plan. Some of the proposed offshore stations were omitted to permit a more extensive search along the 1,000-fathom curve, and also making a set in the northern end of Great South Channel (station 7) to determine whether the bluefin tuna had actually left this well known (Murray 1952, 1953, 1954) summer and early

Table 1 - Station Data and Catches for R/V *Crawford* Cruise 56, November 1960
(Temperatures, salinities and depths are mean values for each station. All fish brought alongside and identified are listed.)

Sta. No.	Date Nov.	Lat.	Long.	No. of Hooks	Bluefin Tuna	Other Tuna	Misc. Fish	Sharks	Temp.		Surf. Sal. ‰	Depth in Fathoms
									Surf.	180 Feet		
1	12	39°16'	71°53'	310	53	3A 1BE	2LL	2B 2H	62.0	60.6	34.55	1,000
2	13	36°56'	74°18'	360	2	1A			63.9	63.3	34.99	1,000
3	14	35°31'	74°27'	400		3YF 1BK		4B 8S 1H	75.1	74.4	36.22	1,200
4	15	27°28'	71°53'	400		1A	1SL		63.1	62.9	34.91	1,700
5	16	38°11'	69°59'	430		5A	3LL	2M 1H	66.0	64.6	35.28	1,940
6	17	39°52'	68°56'	320	@187				62.3	63.2	34.09	900
7	18	41°37'	68°58'	200				1B@65 P	50.7	49.2	34.35	80
8	21	38°45'	68°05'	330				1B	61.7	63.4	34.59	2,030
9	22	40°28'	66°51'	350	5	1BE	1LL	31B	58.7	59.7	34.31	1,000
10	23	41°43'	65°28'	450	6		IS 20LL	1B 10 P	49.1	45.5	32.40	1,000
11	24	42°03'	64°21'	170	1		2LL	1B	51.2	51.6	32.09	1,225
12	25	40°49'	64°57'	490	1	2A	3LL ISL	2B	57.7	61.6	34.26	2,095
13	26	40°03'	67°37'	500	30	10A 4BE	IS 1LL 10	3B	62.0	62.4	35.03	1,200
14	27	39°45'	70°17'	510	70	1A			56.1	62.7	33.65	850
Totals				5,220	@355	23A 6BE 3YF 1BK	32LL 2SL 2S 10	44B 2M @75 P 8S 4H				

Abbreviations: Tuna - A = albacore, BE = big-eyed, BK = blackfin, YF = yellowfin.
Sharks - B = blue, H = hammerhead, M = mako, P = porbeagle, S = silky or sickle.
Misc. Fishes - LL = longnosed lancetfish, SL = shortnosed lancetfish, O = opah, S = swordfish.
@ - Approximate count. Sixty fish were taken on board and 102 tagged and released. The number lost alongside could not be counted exactly due to the intense activity of all hands, but it was conservatively estimated at 25 fish.

fall feeding ground. Adverse weather precluded operations on 2 days and also caused drastic curtailment of station 11, which was made 15 miles off the planned position on the 1,000-fathom curve. Fourteen long-line sets were successfully completed in 17 days at sea, a fortunate occurrence at that time of year (November). At least 3 strikes were obtained on trolled lures in the vicinity of stations 6, 9, and 13, respectively. All resulted in straightened hooks or parted gear.

DISCUSSION

While bluefin tuna were found along the 1,000-fathom curve for nearly 1,000 miles, from Norfolk Canyon (31°56' N., 74°18' W.) to the Eastern Channel (41°45' N., 65°25' W.), and

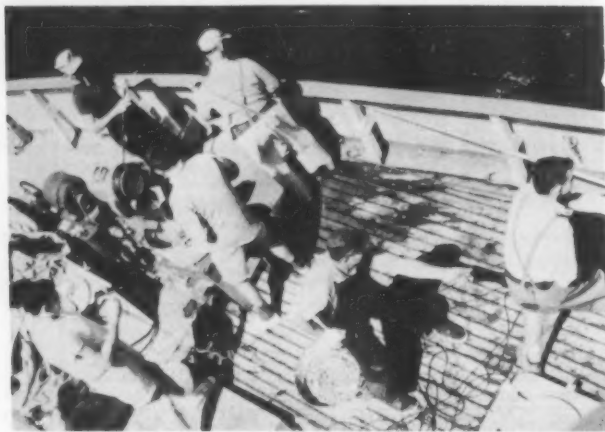


Fig. 4 - Hauling long-line gear on board R/V *Crawford*. The men at the rail tend the brake of the hauler and bring the branch lines through the roller removing baits and boating or tagging fish with the assistance of the men who haul and coil the float lines (right). The man at the hauler arranges the branch lines and hooks in the tub as the main line is coiled automatically, while his helper disconnects the lines, brings empty tubs, and removes the full ones.

northeastward at stations 11 and 12 (fig. 3), the outstanding result of the cruise was the discovery of the previously unknown and exceptionally dense concentration of this species indicated by the heavy catches at stations 1, 6, 13, and 14. The rate of 58 tuna per hundred hooks at station 6 is believed to be the highest ever experienced in exploratory long-line fishing in the northwestern Atlantic. Only 5 of the 320 baits set out at this station were recovered. The area of abundance extended at least 250 miles along the 1,000-fathom curve from the vicinity of Lydonia Canyon (40°02' N., 67°36' W.) to somewhere southwest of Hudson Canyon (39°16' N., 71°54' W.). The southwestern limit was poorly defined, as the next station in that direction was 180 miles away. The row of stations (3, 4, 5, and 8) further south yielded no bluefin, nor did station 7, inside of the 1,000-fathom curve. The northeastern limit of the thickly-popu-

lated area, as indicated by long-line catches, was fairly well established by the poor results at station 9, only 43 miles from Lydonia Canyon. The eastward extent of the species was not determined as some bluefin were taken at each of the 4 easternmost stations, 9-12. The duration of the concentration can only be estimated from the failure of the *Delaware* to catch bluefin in that general area in September and early October, and again in January and February.

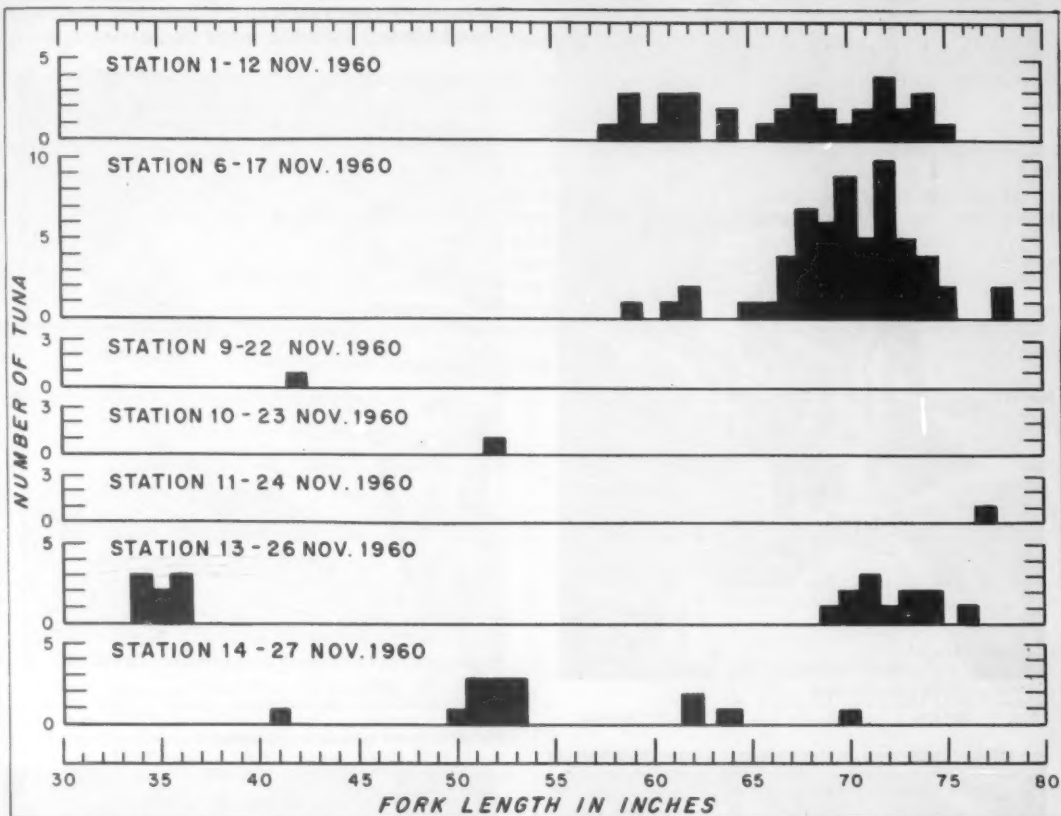


Fig. 5 - Length frequencies by 1-inch groups of bluefin tuna brought aboard R/V *Crawford* during cruise 56, by stations. Lengths were measured to the nearest inch with a tape laid along the body from tip of upper jaw to fork of tail.

Bluefin tuna were caught in waters whose average temperatures ranged from 49.1° to 63.9° F. at the surface and 45.5° to 63.4° F. at 180 feet. The average surface salinities varied from 32.90 to 35.30 parts per thousand. The larger catches, however, occurred in narrower temperature ranges of 56.1° to 62.3° F. at the surface and 60.6 to 63.2° F. at 180 feet, and in surface salinities of 33.65 to 35.30 parts per thousand. At two of the most successful stations, however, there were considerable differences between the temperatures observed at the opposite ends of the lines, and the bathythermograph slides also showed very complicated temperature structures. Furthermore, all 4 heavy catches were made at the entrances of canyons. It is possible that greater mixing of deep and surface waters occurs in those places, furnishing richer feeding grounds.

The dense schooling of this species may have been in preparation for migration to the offshore wintering grounds located during *Delaware* Cruise 59-1. The size composition of the bluefin tuna boated at the respective stations (fig. 5) suggests that the population was

changing. Those taken at stations 1 and 6 (12 and 17 November) were all over 57 inches long, but at stations 13 and 14 (November 26 and 27) in the same general area, many smaller ones were caught. A heavy concentration of this species was observed at about $38^{\circ}30' N$, and $68^{\circ}30' W$, in late May 1959 during Delaware cruise 59-6 (Anonymous 1959b). Fishing in the same area by the trawler Golden Eagle in early June produced no fish, but they were found closer inshore, near the area of the

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Fig. 6 - Bringing a large bluefin tuna aboard R/V Crawford.



Fig. 7 - Part of a catch of medium bluefin tuna from the concentration discovered by R/V Crawford along the 1,000 fathom-curve off southern New England.



Fig. 8 - The author, chief scientist of R/V Crawford cruise 56, obtaining length-weight data for an albacore. Other albacore and small bluefin tuna from a catch made 80 miles south of Woods Hole are seen in the background.

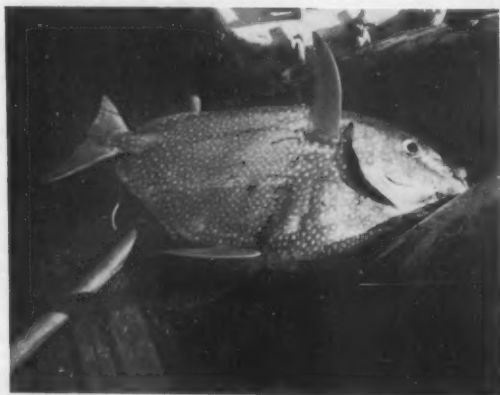


Fig. 9 - An opah or moonfish, a little known oceanic species taken during cruise 56 of the R/V Crawford.

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Crawford catches (J. L. Squire, Jr., personal communication). Many of the bluefin tuna caught on the Delaware were tagged and one was recaptured off Provincetown, Mass., in August 1959 (Mather 1960). Those observations suggest that the medium bluefin tuna tend to concentrate in waters, just north of the Gulf Stream in the spring preparatory to moving inshore to their summering grounds, and again along the 1,000-fathom curve in the fall preparatory to moving offshore to their wintering grounds. The trolling strikes and surface sightings indicate that those tuna sometimes feed on the surface along the 1,000-fathom curve during November as well as at the depth of the long-line hooks.

Albacore were extensively but much more thinly distributed (fig. 3), the catch rate never exceeding 2 fish per 100 hooks. They were found in waters whose mean temperatures varied from 56.1° to 66.0° F. at the surface but only from 60.6° to 64.6° F. at 180 feet, and where surface salinities averaged 33.65 to 35.28 parts per thousand. Big-eyed tuna were even less abundant, being found occasionally along the 1,000-fathom line in waters of about 60° F. Yellowfin and blackfin tuna were found only in the warm Gulf Stream water, and the failure to catch any istiophorid fish suggests strongly that they had also left the slope water, where they have been taken during the spring, summer, and early fall, due to its lower temperature. The catches of swordfish are of interest, in the absence of any quantity of data for November, as are the concentrations of porbeagle and blue sharks encountered, and the unusual number of lancetfish taken. Although sharks were numerous at some stations, only 2 of the tuna taken were mutilated, 1 at station 1 and the other at station 14.

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Note: Acknowledgements: This cruise was made possible by grants number G-8339 and G-6172 from the National Science Foundation, by the Associates of the Woods Hole Oceanographic Institution who provided funds for fishing personnel, and by the loan of fishing equipment from the U. S. Bureau of Commercial Fisheries at Gloucester, Mass. Many of the officers and men of the Crawford worked during their off-watch periods to assist in handling the larger catches of fish; in addition, their fine handling of the vessel made it possible to fish successfully in weather which might otherwise have caused disaster. We are most grateful to all those persons and organizations who made the success of this cruise possible.

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THE COMPOSITION OF SHRIMP MEAL MADE FROM FRESH AND SPOILED SHRIMP HEADS^{1/}

By N. Alam Khandker*

ABSTRACT

To determine whether fresh as well as spoiled shrimp heads could be processed by a simple method to make meal was the purpose of this study. The differences in the chemical composition of several types of shrimp meals were observed. The protein content of shrimp meal is low compared to that of menhaden and other commercial fish meals. But even with a protein content of only 40 percent, shrimp meal may be of some commercial value as animal feed and its production might be profitable considering the low cost of processing.

INTRODUCTION

Shrimp heads are usually discarded at sea or in the freezing and canning plants in the process of deheading. In the plant the waste material creates a disposal problem. The head contains much of the viscera and offers a good prospect of turning it into meal for animal feed. At present some heads from canning plants are reduced to meal.

Shrimp heads are not always available in fresh condition, especially when the deheading is done on board the vessel. The effect of spoilage of the raw material on the chemical composition of the final product is not fully known, although it is a general belief that spoilage deteriorates the quality. Lassen et al. (1944) stated that the degree of freshness of the raw material is of primary importance in determining the quality of fish meal. On the contrary, Grau and Williams (1955) observed that growth of chickens was almost the same when they were fed with fish meals made from fresh as from spoiled mackerel.

The chemical composition of shrimp meal has been reported by several workers. The analysis by Daniel and McCollum (1931) showed 47.44 percent protein, whereas later analysis by Manning (1934) showed the much higher value of 54.51 percent. In the process of deheading by hand, the efficiency of the worker determines how much meat clings to the head. This difference may contribute considerably to the observed difference in protein content between shrimp meals.

The present work was done to determine whether fresh as well as spoiled shrimp heads could be processed by a simple method to make meal, and to observe the differences in the chemical composition of several types of shrimp meals in regard to protein, ether extracted fat, moisture, and ash.

MATERIALS AND METHODS

Two lots of shrimp heads were collected from a packing plant at Key West, Fla. The first lot was brought to the laboratory preserved in isopropyl alcohol. No preservative was used on the second lot, but it was kept in the shade at an air temperature of 75° to 80° F. A portion of the heads were taken for processing at 24, 48, and 72 hours from the time when the shrimp were taken out of the ice and deheaded at the packing plant.

To make meal from the shrimp heads, the heads were first dried in the sun. It usually took 24 hours of sunlight. The dried heads were then ground in a Waring blender.

It is believed that shrimp meal could be made on a commercial scale in an almost similar method as that used in the laboratory, thus minimizing the cost of production. The only

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^{1/}This paper is based on thesis work done at the University of Miami in partial fulfillment of Master of Science degree, and submitted in February 1960.

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SEP. NO. 640

machinery required would be a simple grinder. If enough sunlight is not available, a simple hot-air drier could be used to dry the heads. Vincent (1950) calculated that with a simple type of drier and grinder, the total cost for producing one ton of shrimp meal would be \$17.60. This cost includes fuel, labor, electricity, bagging, and also incidental expenses. However, at present the cost of production would be higher than that quoted by Vincent.



Fig. 1 - Deheading of shrimp in a Key West shrimp packing plant.

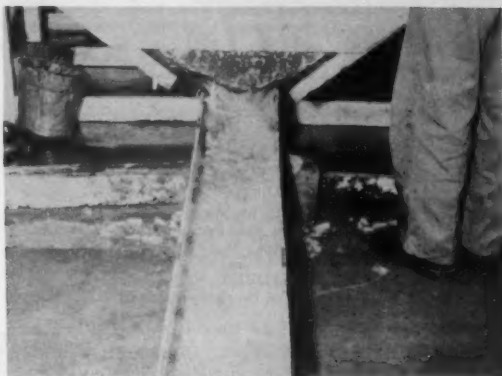


Fig. 2 - Shrimp heads moving through a chute at a South Atlantic shrimp packing plant.

The four samples of meals thus prepared were analyzed for crude protein, fat, moisture, and ash. Nitrogen was determined by Kjeldahl's method. Total quantity of protein ($N \times 6.25$) was calculated from this. In shrimp meal a part of the total nitrogen is contributed by chitin, a N-acetylated glucosamine polysaccharide. Since the proteinaceous fraction of nitrogen apart from that contributed by chitin is the standard for evaluating the meal, the crude protein was estimated by deducting the value of protein contributed by chitin from the total protein content. The determination of protein from chitin was made according to the method devised by Brown (1959) using the factor 6.25.

RESULTS

Table 1 shows the analysis of the different samples of shrimp meals. The percentage of protein was lowered by about 10 percent during the first 24 hours of spoilage. During spoilage enzymatic and bacterial actions break down protein to amino acids and subsequently to ammonia and other volatile substances which are lost.

The meals made from spoiled shrimp heads showed relatively lower protein content than that of the meal made from fresh heads. So, in terms of quantity of protein, the quality was deteriorated. Meals made from spoiled heads had some offensive odor, and that increased with the increase in days of spoilage.

Samples of Meal from	Total Protein	Protein from Chitin	Crude Protein	Ether Extract	Moisture	Ash
Fresh heads	47.95	3.60	44.35	4.28	4.75	20.90
Spoiled heads:						
24 hours ^{1/}	42.68	3.45	39.23	3.39	7.75	20.61
48 hours ^{1/}	42.51	3.00	39.51	3.43	6.75	21.72
72 hours ^{1/}	41.49	3.30	38.19	4.25	7.04	23.10

^{1/} Indicates the lapse of time between when the shrimp were taken from the ice and deheaded at the packing plant.
Note: The difference between total composition shown and 100 percent is undetermined.

CONCLUSION

The protein content of shrimp meal is low compared to that of menhaden and other commercial fish meals, which is generally 55 to 65 percent. However, with an average protein content of even 40 percent, meal made from fresh as well as spoiled shrimp heads may be of some commercial value as animal feed, and its production might be profitable considering the low cost of processing.

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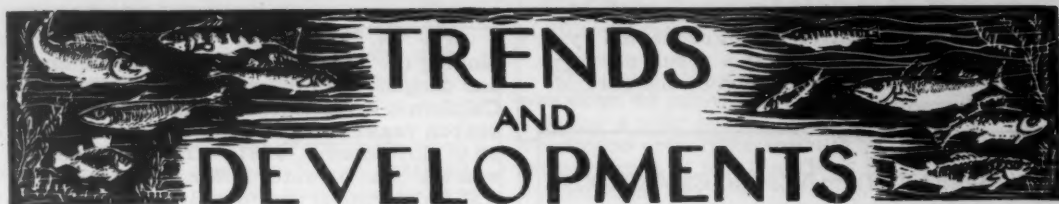
DEVELOPMENT OF HERRING CURING

The preparation of brine-cured herring has been an important industry since the early Middle Ages. The first authentic writings dealing with the curing of herring date from the Twelfth Century. Cured herring was one of the principal articles traded on the continent of Europe by England. The herring fisheries were the cause of several wars in the Baltic between some of the Hanseatic cities and various Baltic states claiming grounds fished by the Hanseatic towns. The wars between England and Holland are held to have been caused in general by their rivalry in trade and in the acquisition of colonial possessions, but the immediate cause was a struggle for control of the herring fishery on the East Anglian coast.

The method of herring curing is considered to have been crude until the time of William Beuckels, a fish merchant of Biervliet, in Flanders, who during the Fourteenth Century, greatly improved the methods in use. This new development laid the foundation for the great wealth acquired later by the Netherlands from the fish-curing business. Beuckels died in 1397, and his work was later considered to be so valuable that a monument to his memory was erected in his native village by Charles V.

The first mention we have of pickled herring in America is by Josselyn, in the Seventeenth Century, who in his *Chronological Observations of America* states: "We used to qualify a pickled herring by boiling of him in milk." It is believed, however, that the pickling of herring was carried on by the earliest settlers of America and possibly by the fishermen who came to these shores from Europe even before the first settlements were made, since herring were readily caught in shore waters and since herring curing was even then the most important fishery industry in Europe.

--Curing of Fishery Products,
Research Report 18



TRENDS AND DEVELOPMENTS

Alaska Fishery Exploration and Gear Research

EXPLORATORY FISHING FOR BOTTOM FISH IN GULF OF ALASKA:

M/V "Tordenskjold" Cruise 2: Exploratory fishing to determine the availability and distribution of the various bottom species from close inshore to 250 fathoms in the Gulf of Alaska between Capes Spencer and St. Elias, was conducted by the U. S. Bureau of Commercial Fisheries from June 2 to September 6, 1961. This work was followed by a short comparison survey in the latitude of Nuka Bay to Portlock Bank until September 15, 1961. The M/V Tordenskjold, a Seattle commercial schooner-type trawler, was chartered for the project. The gear used was a commercial-size otter trawl net spread by galvanized steel doors of special design but readily available commercially in Seattle.



M/V Tordenskjold, the chartered schooner-type trawler.

Objectives of the cruise were multiple. The primary purpose was to obtain general information of latent bottom fish populations,

a vital prelude to systematic exploration and ultimate commercial utilization. Secondary purposes accomplished included tagging of king crab and other species; collection of specimens and scientific data on sizes, ages, and sex ratios of commercially valuable species; and recording of oceanographic and meteorological conditions.

The method was to follow a grid pattern of 261 one-hour trawl stations drawn on U. S. Coast & Geodetic Survey Chart #8002, fishing, wire dragging or sounding alone, whichever seemed best. These stations were 6 miles of latitude apart and 8 miles of longitude. Edges at 140 and 250 fathoms were also tested.

A total of 261 stations were established in the area, of which 200 were found feasible to attempt fishing. The most productive grounds for fish and shellfish appeared to be shoreward from about 70 fathoms, with exceptions of certain deeper tows in submarine canyons and on deeper edges beyond 100 fathoms. Large mid-depth areas were found almost completely unproductive of commercial species.

Note: See Commercial Fisheries Review, Dec. 1961 p. 42.



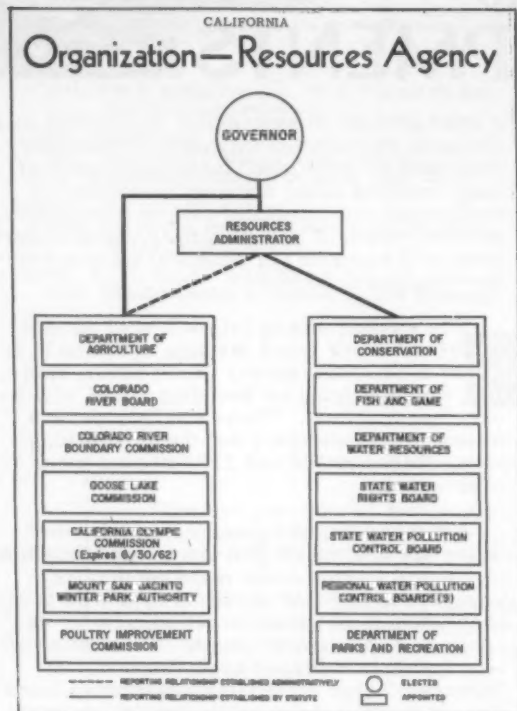
California

FISHERIES INCLUDED IN NEW NATURAL RESOURCES AGENCY:

As of October 1, 1961, the California Department of Fish and Game became one of several new state agencies, whose administrators are responsible to the Governor of California for the policy-making and program evaluation activities of most state departments, boards, and commissions. The administrators were appointed by the Governor.

Fish and Game is now a part of the Resources Agency.

Part of the reorganization came about as a result of legislative action requested by the Governor. The rest is a result of temporary administrative action on the part of the Governor.



In submitting the new combined agencies plan the Governor said that State government has grown too unwieldy with too many department heads answering directly to the Governor.

The Governor says the new setup will permit much better coordination among and within the agencies and give him a more workable organization in that lines of communication will be more direct within the agencies and between the agencies and his office. He believes also that the top level authority of the agency administrators--just under the Governor's level--will afford better long-range planning and program evaluation.

* * * * *

SHRIMP AND CRAB STUDIES CONTINUED:

M/V "N. B. Scofield" Cruise 61S7: Exploring for concentrations of pink shrimp and dungeness crabs was the objective of the California Department of Fish and Game research vessel N. B. Scofield from September 28 to November 9, 1961. The area covered was the coastal waters off northern and central California from Fort Bragg to San Francisco.

SHRIMP: The shrimp phase of the trip was: (a) to explore for concentrations of pink shrimp, *Pandalus jordani*; (b) to determine size, sex, and weight of shrimp from different areas; (c) to make bathythermograph casts to obtain bottom temperatures in shrimp fishing areas.

A total of 66 tows was made with a 20 x 6 ft. beam trawl having a cotton net of 1½-inch mesh--32 of the 66 tows were in Area B-1 from Big Flat to Westport and 34 in Area B-2 from Ft. Ross to Bodega Head.

The best shrimp catches in Area B-1 were made off Usal in 75 to 80 fathoms and off Westport in 70 to 73 fathoms. One tow off Usal produced 1,800 pounds of shrimp per hour and another 900 pounds per hour. The area of concentration, which measured approximately 1½ x 4 miles, was considerably reduced compared with the concentration area a year ago. At that time, the school measured approximately 3 x 15 miles and catches at the rate of 2,000 pounds per hour were quite common. Another small area of shrimp concentrations was discovered off Westport where one tow produced 450 pounds per hour. It measured approximately 2 x 3 miles and tows within the perimeter ranged from 100 to 450 pounds per hour. No shrimp concentration could be found off Big Flat where six tows were made in 50 to 80 fathoms.

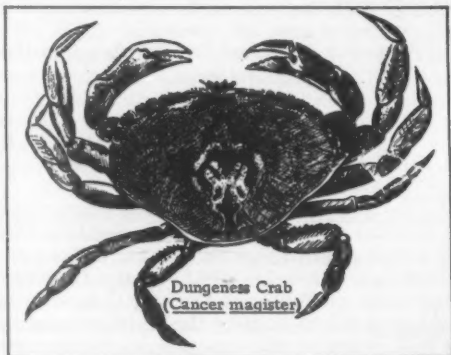
Area B-2 operations revealed a shrimp school of minor concentration off Ft. Ross and the Russian River in 54 to 64 fathoms of water. It was approximately 3 miles wide by 7 miles long. Most of the tows within the perimeter produced catches of 100 to 200 pounds per hour; one tow produced 390 pounds per hour.

Samples of shrimp were obtained in both areas (B-1 and B-2) and in 56 of the 66 tows made. Fifty shrimp from each tow were

sexed, measured, and weighed at sea. The counts typically ranged from 70 to 100 per pound (heads on) in both areas. Many of the female shrimp contained head roe and a few were carrying eggs.

Sixty-four bathythermograph casts were made. Bottom temperatures were obtained in all areas where shrimp were found. These temperatures will be determined from the slides at a later date. Surface temperatures ranged from a high of 58.5° F. off Bodega Head on October 1 to a low of 50.4° F. off Usal on October 10.

CRAB: The crab phase of the trip was: (a) to random-sample the preseason population of market or dungeness crabs (*Cancer magister*); (b) to determine size, sex ratios, and conditions of crabs from different areas.



Sampling stations were selected randomly from the crab area between Point Montara and the Russian River. Fifty-five 40-inch commercial-type crab traps, without escape ports, were fished 6 to 40 fathoms. A string of five traps was baited with rockfish carcasses and squid and allowed to fish overnight at each station; however, several strings were not pulled for 43 to 96 hours because of bad weather.

In all, 4,316 crabs were taken in the traps; 1,595 legal males, 2,566 sublegal males, and 155 females. Twenty-five of the females were carrying eggs. The average legal catch per trap was 3.2 crabs which is very poor compared with previous years. The sublegal males averaged 5.1 per trap which was much higher than last year's catch.

The best catches were in the vicinity of the San Francisco Lightship northwest

toward Point Reyes and south to Pt. Montara in 10 to 25 fathoms.

The preseason catch of legals this year was down 44 percent from last year, indicating a poor season is in store for San Francisco crab fishermen. The decrease in abundance of legal crabs is believed to be due to unfavorable environmental conditions which reduced the strength of the incoming year-classes. This is borne out by the fact that the preseason sublegal catch was low in both 1959 and 1960.

Note: See Commercial Fisheries Review, Dec. 1961 p. 24.

MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 61N17a & b-Salmon: The midwater trawl operations of the California Department of Fish and Game research vessel Nautilus were continued (Nov. 7-10, 20-22, 1961) in the Carquinez Strait area to capture marked salmon fingerlings on their seaward migration. A nylon midwater trawl with 25-foot square opening was used.

Trawling in Carquinez Strait was conducted between 8 a.m. and 3 p.m. and each tow was for 20 minutes. Surface tows were alternated between upstream and downstream and between the north shore, center, and south shore of the channel. A flow meter was used to measure the amount of water strained by the net on each tow.

A total of 78 tows was completed in the Strait during this cruise yielding a catch of 158 king salmon (*Oncorhynchus tshawytscha*) fingerlings, and 2 king salmon adults, none of which was marked. One marked adult steelhead (*Salmo gairdneri*) was also captured.

Other species appearing in the catch, listed in order of abundance were: northern anchovy (*Engraulis mordax*)--6,950; American shad (*Alosa sapidissima*)--4,701; striped bass (*Roccus saxatilis*)--1,527; topsmelt (*Atherinops affinis*)--125; Pacific herring (*Clupea pallasii*)--75; starry flounder (*Platichthys stellatus*)--5; jack smelt (*Atherinops californiensis*)--1; tom cod (*Microgadus proximus*)--1; northern midshipman (*Porichthys notatus*)--1; three-spined stickleback (*Gasterosteus aculeatus*)--1; and threadfin shad (*Dorosoma petenense*)--1 fish. The

recovery of the threadfin shad marks the first observation of this species in delta waters.

Note: See Commercial Fisheries Review, Jan. 1962 p. 14.

**M/V "N. B. SCOFIELD"
STUDIES RADIOACTIVITY
OFF SAN CLEMENTE ISLAND:**

Cruise 61S6: To collect a variety of biological and water samples which might be expected to accumulate radioactive particles resulting from a U. S. Navy experiment using radio-isotopes as a tracer in underwater explosions and to observe the effects on marine life of a 5-ton high explosive charge were the objectives of the cruise September 18-20, 1961. The area covered was in the vicinity of Wilson Cove on northeast side of San Clemente Island.

On September 19 at approximately 3:25 p.m., eleventh in a series of high-explosive charges was detonated by the U. S. Navy. Facts concerning the charge are: (a) size and form--10,000 pounds of HBX-1 precast in a spherical shape about 5½ feet in diameter with a booster charge of 125 lbs. of TNT; (b) depth of charge--16 feet; (c) distance from shore--2,400 feet; (d) depth of water--300 feet; (e) location of charge--lat. 32°57'21" N., long. 118°30'20" W.; (f) radioactive tracer--approximately 600 grams of insoluble particulate Lutetium Oxide containing about 16 grams (500-800 curies) of radioactive Lutetium-177 Oxide (half-life 6-8 days) was placed inside the charge; (g) a single recording barge, and six small boats carrying instruments were located at points about 1,200 feet from the shot point.

On the morning of September 19 the N. B. Scofield placed anchored set lines and lobster traps at two locations on a line between the shot point and Wilson Cove.

After the detonation, the vessel proceeded into the explosion area and a skiff was put over the side to allow greater freedom in picking up samples.

The Navy marked the explosion area with green dye (fluorescein) and two parachute buoys. One buoy had a 50-foot line, and the other a 20-foot line. Both were marked with flashing lights and served to indicate the general drift of the water mass.

The fish kill included approximately 25 rockfish (*Sebastes* sp.) and 2,000 jack mackerel (*Trachurus symmetricus*).

At 1700 a drift set-line was placed about 200 feet north of the edge of the green dye marker.

The vessel then picked up samples of dead fish, occupied a night-light station, made several plankton tows and water sample collections.

The set lines and traps were picked up during the morning of September 20. A plankton tow was conducted about 5 miles NNE. of the northern tip of San Clemente Island in the area where the last traces of green dye were perceived and where the water mass appeared thoroughly mixed with open-sea water.

The vessel returned to Los Angeles Harbor.

**PELAGIC FISH POPULATION
SURVEY CONTINUED:**

M/V "Alaska" Cruise 61A7-Pelagic Fish: The coastal waters from Santa Rosalia Bay, Baja California to San Diego, Calif., were studied October 2-20, 1961, by the California Department of Fish and Game research vessel *Alaska* (1) to survey the sardine population to determine the amount of recruitment from the 1961 spawning and to measure the population density of older fish; (2) to sample Pacific mackerel, jack mackerel, and anchovies for age and distribution studies.



M/V *Alaska* Cruise 61A7-Pelagic Fish.

A total of 79 night light stations were occupied. Sardines were taken at 5, anchovies at 9, Pacific mackerel at 6, and jack mackerel at 4.

The vessel traveled 469 miles between light stations during which 36 anchovy schools and 16 unidentified schools were observed. An extensive school group of large Pacific mackerel was sighted during daylight hours off Cape Colnett.

Sardines of the 1961 year-class were taken at two stations. These young fish were taken from schools comprised of over 98 percent anchovies. In addition, one sample comprised of fish of the year mixed with adult sardines was taken. Adult sardines were taken at two additional stations.

Many schools of anchovies were attracted to the light; however, no sets were attempted when only small "pinhead" size anchovies were present. Large anchovies (110-135 mm.) were distributed more offshore than the smaller ones. Stations located 6 to 15 miles offshore in warmer and clearer water produced the larger fish.

This cruise completes the 1961 young fish survey in Baja California. This and cruises 61A5 and 61A6, show results similar to the 1960 surveys in the same area: sardines were scarce and anchovies were abundant. As in 1960, the incoming year class appears to be of subnormal strength. Anchovies are again abundant, especially in central Baja California.

One set was made with a deep-sea free-floating fish trap on loan from Scripps Institution of Oceanography. The set, made in 850 fathoms, caught two deep-water crabs (*Paralomis* sp.). Recovery of the trap at night was difficult because, at close range, radar echoes from waves obscure the echo from the trap reflector. This problem can be alleviated in the future by scheduling the return of the traps to the surface during daylight hours when visual means can be used to supplement radar.

Sea surface temperatures ranged from 58.9° F. near Point Santo Tomas to 70.2° F. at Santa Rosalia Bay. Fair weather prevailed during the entire cruise.

* * * * *

M/V "Alaska" Cruise 61A8-Pelagic Fish:
A survey was made of the coastal waters from Los Coronados Islands to Point Conception, including the Channel Islands by the California Department of Fish and Game research vessel Alaska during October 30-November 17, 1961. The purpose of the trip was: (1) to determine the amount of recruitment from this year's sardine spawning and to measure the population density of older fish; (2) to sample Pacific mackerel, jack mackerel, and anchovies for age and distribution studies; (3) to make incidental collections of other species.

A total of 108 light stations were occupied. Sardines were collected at three stations, northern anchovies at 13, Pacific mackerel at 10, and jack mackerel at 8. Squid were seen or sampled at 32 stations.

In the course of 510 miles of nighttime scouting, 159 schools were sighted. These included 67 anchovy, 67 mackerel, and 25 unknown schools. No schools were identified as sardines.

Adult sardines caught off Gaviota and fish of the year caught in Los Angeles Harbor were mixed with large numbers of anchovies. Only the adult sardines taken near Santa Catalina Island were from an unmixed school.

The southern California survey in 1961 showed the lowest density of sardines since 1957. The sardine density was about one-half of that found during the 1960 survey and about one-sixth of that found in 1959. The lack of sardines in southern California this year is consistent with the very poor commercial season to date.

Sea surface temperatures ranged from 56.3° F. at Carrington Point, Santa Rosa Island and San Mateo Point, to 62.2° F. off the west end of Catalina Island.

Note: See Commercial Fisheries Review, December 1961 p. 25, November 1961 p. 15.



Cans--Shipments for Fishery Products, January-October 1961

Total shipments of metal cans during
January-October 1961 amounted to 108,437

short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 107,858 tons in the same period of 1960. Canning of fishery products in January-October 1961 was confined largely to tuna,



jack mackerel, Pacific salmon, and Maine sardines. Although the packs of Maine and California sardines, and shrimp were down, greater packs of tuna and salmon more than offset those declines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Central Pacific Fisheries Investigations

TUNA STUDIES IN SOUTH PACIFIC BY M/V "CHARLES H. GILBERT":

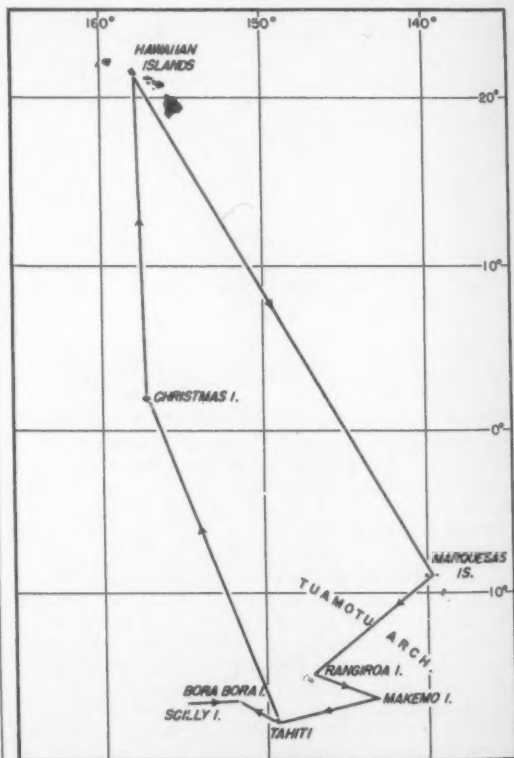
Cruise 54 (September 29-December 4, 1961): Two months of tuna studies in the Marquesas, Tuamotu, Society, and Line Islands were completed when the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert returned to its base at Kewalo Basin, Honolulu, on December 4, 1961. The expedition successfully carried out its principal missions of collecting tuna blood samples and observing the behavior of skipjack tuna in the various island areas.

Blood specimens from 760 skipjack and a smaller number of yellowfin tuna were collected. Analysis for blood types is expected to provide information with which to check and refine the biologists' theories about the relationships of the skipjack populations of the various South Pacific island groups to one another and to the skipjack (aku) of Hawaiian waters. During the cruise, observations of the ocean's temperature and salinity were combined with blood collection work with the idea that some environmental factors might appear related to the population differences shown by blood analysis.

High-speed movie cameras were used in the underwater observation chambers of the Charles H. Gilbert to film the extremely rapid movements of feeding skipjack (Katsuwonus pelamis). The details of fin and

mouth movements revealed by these films may give clues to an understanding of the variable and unpredictable response of tuna to bait and fishing lures, a practical problem for commercial fishermen. Material was also gathered for a comparison of the rate at which tuna schools take the hooks and the amount of food in the stomachs of the fish. Four skipjack and 1 yellowfin (Neothunnus macropterus) schools were observed from the bow chamber. Owing to a shortage of bait, no skipjack were caught by pole-and-line for stomach analyses from these 4 schools. Biologists feel that it would be premature to draw any conclusions from their first experiment with plastic skipjack "decoys" towed in the vicinity of skipjack schools, but it was their impression that the skipjack showed a curious interest in the artificial tuna and were not repelled by them.

The availability of the Marquesan sardine used as tuna bait was moderately good in



M/V Charles H. Gilbert Cruise 54.

certain areas of the Marquesas, but the schools of sardine were smaller than those found on earlier cruises. Skipjack were moderately abundant in all of the areas visited. However, with the exception of a few schools of 28-30 pound fish encountered in the Marquesas, the schools were composed of medium and small skipjack.

In the Marquesas Islands, attempts were made on 5 different schools to obtain synchronous records of skipjack behavior, stomach contents, and catch rates throughout a fishing period. Three of the schools remained at the boat long enough to obtain the desired data. During one of the 3 sequences not only skipjack but also yellowfin and dolphin (*Coryphaena hippurus*) were observed and caught. Digestive tracts of 203 skipjack, 15 yellowfin, and 4 dolphin were preserved.

The expedition accomplished a number of interesting secondary missions, including transportation of 2,000 live pearl oysters from Scilly Island (Fenua Ura) to Bora Bora at the request of French authorities, collection of reef-fishes from over 20 localities, and collection of blood serum from Marquesan fresh-water eels. In cooperation with the Division of Fish and Game of the State of Hawaii, about 7,000 live groupers and snappers, valuable food fish of types lacking in Hawaiian waters, were brought from Moorea in the live-wells of the Charles H. Gilbert and released around Oahu.

MONOFILAMENT GILL NETS TESTED IN HAWAIIAN SKIPJACK FISHERY:

Trials of monofilament gill nets in the Hawaiian skipjack tuna fishery were carried out from July 23, 1961 to September 29, 1961. These nets were successful in catching skipjack but have not yet been fished in such a manner as to demonstrate their commercial feasibility.

This study, a cooperative effort of the Hawaii Division of Fish and Game and the U. S. Bureau of Commercial Fisheries Biological Laboratory in Hawaii, was undertaken to develop a means of increasing the skipjack catch. The Hawaiian pole-and-line skipjack fishery is presently a declining industry, as a result of a static level of fishing efficiency and increasing operational costs.

Monofilament nets fulfilled the basic requirement of being usable by the existing fleet and were, in addition, noted for a high fishing efficiency and modest cost. Although several modifications of the gear were used, the basic shackle was 100 fathoms in length and 10 fathoms in depth. Nets were of two mesh sizes; a 5½-inch mesh (stretched measure) net for the smaller skipjack ranging from 4 to about 10 pounds and a 7½-inch mesh net for skipjack of about 18 pounds. A skipjack sampan, the Broadbill, was chartered for the trials.

The two months of field work were concentrated on developing a daylight fishery, and in this respect the method developed has not been tried in other fisheries. The method was to locate a skipjack school by the usual pole-and-line method of finding "working" bird flocks, to chum the fish school to the stern of the boat, set a single shackle of net from a wooden bin while the boat moved ahead at chumming speed, carry out pole-and-line fishing, and haul in the net with a powerblock. The use of live-bait was to create a feeding frenzy, since skipjack are able to see monofilament nets in the clear waters surrounding the Hawaiian Islands.

Field work was suspended when the small catches by the commercial boats indicated an earlier than usual end of the skipjack season. While the results were inconclusive, they were moderately encouraging. The highest catch from a single set of the monofilament gill net was 122 skipjack. The catches from 32 sets were not large enough to make it appear likely that the gill net will supplant the present pole-and-line method. It appears likely, however, that a combination of the two methods can be used effectively to increase the catch from each school fished. Additional trials are planned during the 1962 skipjack season.

Note: See Commercial Fisheries Review, Oct., 1961 p. 11.



Federal Aid for Sport Fish and Wildlife Restoration

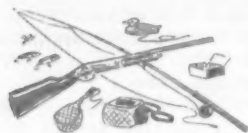
INTERIOR APPORTIONS MORE FUNDS TO STATES:

Distribution of an additional \$6,950,000 to States for restoration of fish and wildlife projects for the year ending June 30, 1962,

was announced on November 30, 1961, by Secretary of the Interior Stewart L. Udall. This brings to \$19,800,000 the total to be apportioned, since \$12,850,000 was allotted on a preliminary basis last July 1 for State fish and wildlife projects.

Of the \$19,800,000, a total of \$14,000,000 is for State and territorial areas for restoration of wildlife and \$5,800,000 for restoration of fish.

The fish and wildlife restoration funds come from Federal excise taxes collected from manufacturers, importers, and producers of certain types of hunting and fishing equipment.



Federal Aid money is matched by the States on the basis of not to exceed 75 percent Federal to 25 percent state funds.

Federal Aid to Fish and Wildlife Restoration programs are administered by the Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service.

Note: See *Commercial Fisheries Review*, August 1961 p. 24.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-SEPTEMBER 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.6 million pounds of fresh and frozen fishery products were purchased in September 1961 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in August 1961 by 20.6 percent and 5.9 percent under the amount purchased in September 1960. The value of the purchases in September 1961 was lower by 12.1 percent as compared with the previous month, but 2.5 percent greater than in the same month of 1960. Higher prices accounted for the greater value for September 1961.

During the first 9 months of 1961 purchases totaled 16.6 million pounds (valued at \$8.4 million)--a drop of 6.4 percent in quantity and 9.1 percent in value as compared with the same period in 1960.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, September 1961 with Comparisons

QUANTITY				VALUE			
Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
1961	1960	1961	1960	1961	1960	1961	1960
(1,000 Lbs.)				(\$1,000)			
1,586	1,686	16,587	17,722	951	928	18,355	19,188

Prices paid for fresh and frozen fishery products by the Department of Defense in September 1961 averaged 60 cents a pound, 5.8 cents more than the 54.2 cents paid in August 1961 and 5 cents more than the 55 cents paid during September 1960.

Canned Fishery Products: Canned salmon was the principal canned fishery product purchased for the use of the Armed Forces dur-

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, September 1961 with Comparisons

Product	QUANTITY				VALUE			
	Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
	1961	1960	1961	1960	1961	1960	1961	1960
	(1,000 Lbs.)				(\$1,000)			
Tuna	-	116	4,393	2,370	-	51	1,940	1,044
Salmon	1,401	2,304	1,403	2,308	891	1,565	893	1,568
Sardine	6	-	121	99	2	-	57	41

ing September 1961. In the first 9 months of 1961, purchases of the three canned fishery products were up 23.9 percent in quantity, and 8.9 percent in value.

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-OCTOBER 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.6 million pounds of fresh and frozen fishery products were purchased in October 1961 by the Military Subsistence Supply Agency. This was substantially greater than the quantity purchased in September 1961 by 65.8 percent and was 48.9 percent above the amount purchased in October 1960. The value of the purchases in October 1961 was up by 80.5 percent as compared with the previous month and 86.4 percent more than in the same month of 1960. The greater increase in value was because of higher prices in 1961.

During the first 10 months of 1961 purchases totaled 19.2 million pounds (valued at \$10.1 million)--a drop of only 1.4 percent in quantity and 0.4 percent in value as compared with the same period in 1960.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, October 1961 with Comparisons

QUANTITY				VALUE			
Oct.		Jan.-Oct.		Oct.		Jan.-Oct.	
1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) (\$1,000)			
2,629	1,766	19,216	19,488	1,717	921	10,072	10,109

Prices paid for fresh and frozen fishery products by the Department of Defense in October 1961 averaged 65.3 cents a pound, 5.3 cents more than the 60 cents paid in September 1961 and 13.1 cents more than the 52.2 cents paid during October 1960. The higher average price for purchases in 1961 was because of generally higher prices for all types of fresh and frozen fishery products and probably an increase in the purchase of higher-priced products.

Canned Fishery Products: Canned tuna was the principal canned fishery product purchased for the use of the Armed Forces during October 1961. In the first 10 months

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, October 1961 with Comparisons

Product	QUANTITY				VALUE			
	Oct.		Jan.-Oct.		Oct.		Jan.-Oct.	
	1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.)								
Tuna	2,217	771	6,610	3,141	1,114	2,349	3,054	1,393
Salmon	-	1,285	1,403	3,593	-	868	893	2,436
Sardine	4	25	125	124	2	10	59	51

of 1961, purchases of the three canned fishery products were up 18.9 percent in quantity and 3.2 percent in value. In 1961 considerably more tuna and substantially less salmon was purchased than in 1960, which accounts for the smaller increase in value.

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-NOVEMBER 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.4 million pounds of fresh and frozen fishery products were purchased in November 1961 by the Military Subsistence Supply Agency. This was less than the quantity purchased in October 1961 by 10.3 percent, but was 36.9 percent above the amount purchased in the same month of 1960. The value of the purchases in November 1961 was down 24.9 percent as compared with the previous month, but 43.5 percent more than in the same month of 1960.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, November 1961 with Comparisons

QUANTITY				VALUE			
Nov.		Jan.-Nov.		Nov.		Jan.-Nov.	
1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) (\$1,000)			
2,358	1,723	21,574	21,211	1,289	898	11,361	11,007

During the first 11 months of 1961 purchases totaled 21.6 million pounds (valued at \$11.4 million)--up 1.7 percent in quantity and 3.2 percent in value as compared with the same period in 1960.

Prices paid for fresh and frozen fishery products by the Department of Defense in November 1961 averaged 54.7 cents a pound, about 2.6 cents more than the 52.1 cents paid in November 1960 and 10.6 cents more than the 65.3 cents paid the previous month. This means that more of the higher-priced fishery products were bought in October than in November 1961.

Canned Fishery Products: Canned tuna was the principal canned fishery product purchased for the use of the Armed Forces

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, November 1961 with Comparisons

Product	QUANTITY				VALUE			
	Nov.		Jan.-Nov.		Nov.		Jan.-Nov.	
	1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.)								
Tuna	48	422	6,658	3,563	26	196	3,080	1,589
Salmon	-	-	1,403	3,593	-	-	893	2,436
Sardine	6	2	131	126	4	1	63	52

during November 1961. In the first 11 months of 1961, purchases of canned fishery products were up 12.5 percent in quantity, but down 1.0 percent in value. The value was down because considerably more tuna and substantially less salmon was bought in 1961.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

MILITARY SUBSISTENCE SUPPLY AGENCY NAME CHANGED:

The Military Subsistence Supply Agency, effective January 1, 1962, changed its name to Defense Supply Agency. Also the field offices were redesignated Defense Subsistence Supply Centers. The change in the

titles of the Military Subsistence Supply Agency Offices does not affect the mission or responsibilities of those offices.

Note: See Commercial Fisheries Review, Oct. 1959 p. 26.



Fisheries Loan Fund

LOANS APPROVED, NOVEMBER 1-DECEMBER 31, 1961:

From the beginning of the program in December 1956 through December 31, 1961, a total of 1,066 applications for loans amounting to \$30,843,057 were received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total, 560 (\$13,705,439) were approved, 363 (\$9,580,710) were declined or found ineligible, 104 (\$5,466,077) were withdrawn by applicants before being processed, and 39 (\$542,037) were pending as of the end of 1961. Of the applications approved, 222 (\$1,548,794) were approved for amounts less than applied for.

The following loans were approved from November 1, 1961, through December 31, 1961:

New England Area: Harold D. Abbott, East Boothbay, Maine, \$1,700; Gaetano S., Inc., Boston Mass., \$10,000; and Little Chuck Corp., Boston, Mass., \$7,400.

South Atlantic and Gulf Area: Tiliakos Bros., Fernandina Beach, Fla., \$16,500; Harold L. Von Harten, Key West, Fla., \$4,255; James L. Simpson, St. Mary's Ga., \$18,000; John Zar, Jr., Lafitte, La., \$14,000; and O. W. Franks, Morgan City, La., \$11,500.

California Area: Jim A. Trammell, Costa Mesa, \$5,970; Bruce L. Thompson, Crescent City, \$4,200; David H. Krueger, Eureka, \$8,300; William Hansen, Morro Bay, \$2,180; Edmund Gann, et al, San Diego, \$128,700; Frank A. Maniscalco, San Francisco, \$5,000; and Neal O. Busch, Sebastopol, \$10,000.

Hawaii Area: Maui Fisheries & Marine Products, Ltd., Kahului, Maui, \$73,292; Sea Queen Fishing Co., Honolulu, \$20,330.

Pacific Northwest: Adolph J. Sund, Ilwaco, Wash., \$8,750; Raymond Hall, Newport, Oreg., \$40,000; Wesley H. Christensen, Port Angeles, Wash., \$8,900; Dwane E. Clark, Port

Angeles, Wash., \$11,000; and George A. Strand, Stanwood, Wash., \$16,528.

Alaska: Douglas Freed, Elfin Cove, \$4,600, and Andrew J. Barlow, Sr., Wrangell, \$5,600.



Fish Flour

INTERIOR DEPARTMENT AIDS IN INTERNATIONAL PROTEIN-DEFICIENCY STUDY:

Participation in a long-range international program to determine the effectiveness of fish flour as an additive in protein-deficient diets by the U.S. Department of the Interior was announced on December 18, 1961.

The program, sponsored by the Food and Agriculture Organization of the United Nations, is an outgrowth of the FAO International Conference on Fish in Nutrition held in Washington, D. C., in September 1961. At the Washington sessions, many scientists expressed the belief that diets deficient in animal protein could be fully corrected by adding from 3 to 10 percent fish flour.

At the close of the meeting a panel of experts, convened by FAO, recommended a long-range program on fish flour research and human feeding studies and asked member nations to volunteer to supply the fish flour needed for the feeding program. The panel also recommended that FAO determine where the feeding studies were to be made. Chile and Peru have offered to furnish facilities for manufacturing the fish flour and have been selected as the countries where the first feeding studies will be made.

The Department has assigned a technologist of the U.S. Bureau of Commercial Fisheries Technological Laboratory, College Park, Md., to assist in this program. The Bureau technologist went to South America and worked with the Chief of the Economic Branch of the Fisheries Division, FAO, Rome, in inspecting fish flour facilities offered by the two Latin American countries and recommending whatever mechanical or manufacturing changes may be necessary to supply the types of protein concentrate needed in the study.

After completing his FAO assignment in Chile and Peru, the Bureau technologist inspected other laboratories and processing plants in South America where fish protein concentrates are being developed. He observed processes in Uruguay. Also, he visited the University of Concepcion in Chile, where fish flour problems are being studied. He consulted with authorities at a Government hospital in Guatemala, where important work on the use of incaparina, a compounded protein food made from locally-available vegetable matter, is being carried out. He stopped in San Salvador to review studies on the use of fish flour as a food supplement in attempts to prevent or cure kwashiorker, a devastating protein-deficiency disease.

In addition to assisting in the FAO study in Latin America, the Bureau technologist collected information regarding fish flour technology and utilization. This will be valuable to research now under way at the Bureau's College Park Technological Laboratory.



Frozen Fish Distribution

TIME-TEMPERATURE STUDIES IN DISTRIBUTION CHANNELS:

Temperature fluctuations of frozen fishery products in distribution channels are being studied by the Gloucester Technological Laboratory of the U. S. Bureau of Commercial Fisheries with the cooperation of the Food Technology Department of the University of Massachusetts.

Arrangements have been made to ship recording thermometers and time-temperature indicators through several distributor-to-retailer channels in the Boston and Gloucester (Mass.) areas and also from warehouses in Hartford, Conn., and Pittsfield, Mass., to retail stores in the northwestern part of Massachusetts. The instruments will be collected at retail stores in various parts of Massachusetts by the University staff who will monitor the temperature of the shipments and provide the Gloucester Laboratory with the data obtained.



Great Lakes

NEW BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL BASE IN LAKE MICHIGAN:

Two U. S. Bureau of Commercial Fisheries research vessels arrived at the port of Saugatuck, Mich., on the eastern shore of Lake Michigan in late November 1961. The biological research vessel Cisco, previously based at Bay City, on Saginaw Bay, Mich., has worked intermittently in Lake Michigan since she was constructed in 1951. The exploratory fishing and gear research vessel Kaho is new, having been accepted from the builders in Toledo, Ohio, just prior to sailing for Saugatuck.

The Saugatuck base, not yet fully completed, will serve as "home port" to these vessels while they take part in scientific programs on the commercial fisheries of the Great Lakes. Saugatuck was chosen as base of operations because of its relatively ice-free winter conditions and its accessibility to Ann Arbor from where Great Lakes research is directed.

The biological research vessel Cisco (a name applied collectively to several species

of Great Lakes whitefish), is of all-steel construction and 65 feet in length, with a 16-foot beam and draft of 7½ feet. She is powered by a 170-hp. Diesel engine and cruises at 10½ m.p.h. The Cisco has accommodations for 4 crew members and 5 scientists.

The Kaho (name derived from Chippawa Indian word for "hunt"), especially designed for exploratory fishing and gear research activities, is also of all-steel construction, with the exception of an aluminum pilothouse. She is 65 feet in length with an 18-foot beam and draft of 7 feet. The Kaho is powered by twin 150-hp. Diesel engines, and has a cruising speed of over 12 m.p.h. The Kaho accommodates a crew of 4 plus 3 scientists at present.

Both vessels are fitted with modern navigation, communication, research, and fishing equipment. Special electronic instruments furnish data on water depth, bottom condition, and subsurface fish distribution; and provide for positioning the vessels accurately on selected fishing or testing stations. Other scientific equipment records water temperatures from lake surface to bottom, recovers water samples simultaneously from various depths, and obtains samples of lake bottom material.

The Cisco has just completed a 2-year study of the status of the chub stocks of Lake Michigan to measure changes that have resulted from decreased predation by the lake trout, and increased predation by the sea lamprey. The small chubs, which were the principal food of lake trout and too small to be attacked by the sea lamprey, are even more abundant than they were during a similar survey in 1954-55.

During the next few years the Cisco will be used primarily in research on Lake Michigan. She will be used in fishery and environmental studies to learn more about factors that influence the abundance, growth, distribution, and movements of commercially important fish. This information should help to develop optimum utilization of the fishery resources of the lake.

The Kaho will be used in studies designed to help Great Lakes commercial fishermen adjust to the changes in fish populations that have resulted from altering environmental conditions and the invasion of the notorious

sea lamprey. Traditional Great Lakes fishing methods were practical when the bulk of commercial catches consisted of such valuable species as lake trout, whitefish, yellow pike, and the larger chubs. To realize profitable fishing on the less valuable species that are now available in great numbers, but are largely underutilized, much more efficient methods are necessary.

Since 1958, the Bureau's Exploratory Fishing and Gear Research, working in Lake Erie with a converted trap net vessel and in Lake Michigan with chartered vessels, has determined that the trawl method of fishing is very effective for taking such plentiful species as chubs, alewife, and smelt. This work will be continued more intensely and primarily in Lake Michigan in the immediate future by the Kaho. The seasonal availability of underutilized species will be determined by area and depth. Standard commercial types and sizes of trawl nets will be used to obtain the vital information. The results will indicate where and when the best fishing is to be expected.

These biological and exploratory fishing activities are part of an integrated Bureau program which also includes studies in processing, marketing, economics, and statistics of commercial fish. The objective of all this attention to Great Lakes commercial fisheries is to determine the extent and characteristics of Great Lakes commercial fish resources and how to best utilize them at a sustained level in complete harmony with other industrial and recreational uses of those waters.



Great Lakes Fishery Investigations

LAKE ERIE FISH POPULATION SURVEY FOR 1961 SUMMARIZED:

The schedule of the U. S. Bureau of Commercial Fisheries research vessel Musky II for November 1961 was reduced in part because of adverse weather and partly to allow time for the annual fall collection of scale samples from fish in the commercial catch. In this final report, the Bureau's biological research on Lake Erie for 1961 is briefly summarized.

A rescheduling of vessel operations early in 1961 permitted staff limnologists to con-

duct special studies aboard the Musky II during one or two weeks a month. Consequently, data on certain physical, chemical, and biological features (temperatures, pH, alkalinity, dissolved oxygen, plankton, and bottom fauna) of the waters of the western basin were collected on a seasonal basis. Special attention was given to low concentrations of dissolved oxygen in the deeper areas of the central basin during midsummer.

Fishery and limnological studies were combined during several cruises. One of these was the annual summer cruise to seven established index stations in the western basin of Lake Erie, and another was a two-week cruise into eastern Lake Erie and western Lake Ontario in late September. The visit to Lake Ontario was the first by a Bureau research vessel.

Fishery operations for 1961 were begun during the first week of April. During the season, experimental trawling was accomplished at 20 different stations on a total of 73 separate vessel trips. Two stations were visited semimonthly to gather pertinent data on abundance, distribution, and seasonal growth of fish. A consecutive three day-night trawling series was conducted at two stations (Bono and East Harbor) during the spring, summer, and fall. Data from collections during the three seasonal series will be tabulated to provide information on the degree of variability among catches in a given area over a short period of time. The data will also contribute to the life-history studies for the various species. Gill-net operations in 1961 were limited to a few overnight sets in the Island region early in the year.

The hatch and survival for the majority of species in Lake Erie appeared to be much better in 1961 than in 1960, although not as successful as in 1959. White bass, yellow perch, and spot-tail shiners were generally plentiful, but catches of young fish of other species were somewhat sporadic.

The cooler water temperatures which prevailed during 1961 apparently influenced the growth rate of numerous species. A retardation of growth of young-of-year fish was clearly apparent by the end of year. Average lengths in inches of young fish in western Lake Erie, at the end of the growing season, were as follows: yellow pike or

walleye, 8.6; yellow perch, 3.5; white bass, 3.4; sheepshead, 3.8; gizzard shad, 3.9; alewife, 4.2; spot-tail shiner, 3.0; emerald shiner, 2.6; and channel catfish, 3.1.

The current status of the yellow pike tagging program is as follows: Of 4,000 yearling yellow pike tagged in the spring of 1960, 447 (11.2 percent) have been recaptured to date--334 in 1960 and 113 in 1961. The 1961 recoveries demonstrated a pronounced movement of yellow pike to the extreme western end of Lake Erie and northward.

Sampling of the major species of fish in the commercial catch was undertaken in the spring and fall. Scale samples were obtained from a total of 3,242 specimens. Yellow perch, white bass, and sheepshead were readily available, but yellow pike catches continued to drop, and other high-value species such as blue pike, whitefish, and ciscoes have practically disappeared from the catch.

The Musky II was placed in dry dock for the winter.

Note: See Commercial Fisheries Review, Jan. 1962 pp. 17-18.

LAKE MICHIGAN FISH POPULATION SURVEY FOR 1961 COMPLETED:

M/V "Cisco" Cruise 9 (October 31-November 13, 1961): Operations of the U. S. Bureau of Commercial Fisheries research vessel Cisco during cruise 9 were seriously curtailed by almost continuous heavy seas. Scheduled work off Sturgeon Bay, Wis., and Frankfort, Mich., was cancelled.

Standard gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch mesh, 100 feet of 2-inch mesh, and 300 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{1}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Charlevoix, Mich., and off Manistique, Mich. All sets were in areas where the water was homothermous (or nearly so); bottom temperatures were 45° to 50° F. (several degrees warmer than during the summer).

Chubs (Leucichthys hoyi), smelt, and alewives were the predominant catches in the Charlevoix area--chubs and alewives at 50 fathoms and smelt at 25 fathoms. In the Manistique area, catches consisted primarily of smelt, chubs, and alewives at 25

fathoms, and chubs, deep-water sculpins, alewives, and smelt at 50 fathoms.

Thirty-minute tows were made with a 50-foot balloon trawl at 15, 25, 35, and 50 fathoms off Manistique, and at 30 fathoms in Little Traverse Bay, east of Charlevoix. Chub catches were 15, 54, 194, 65, and 102 pounds, respectively. All catches contained alewives (11 to 45 pounds) and smelt (up to 287 pounds at 15 fathoms off Manistique). Ninespine sticklebacks (up to 1,000 per tow) were taken in all catches except at 15 fathoms off Manistique, and trout-perch were taken in 3 tows (including the tow at 50 fathoms). Twenty small whitefish (mostly 8 to 9 inches long) were caught in the 15-fathom tow off Manistique. This catch of young whitefish was the largest ever made by the Cisco. Other species in the trawl catches were deep-water sculpins (up to 52 pounds), slimy sculpins, and (in the tow in Little Traverse Bay) spot-tail shiners. The occurrence of sticklebacks, trout-perch, and spot-tail shiners in deep water may be attributed to the general uniformity of the water temperature.

Hydrographic collections and observations were made at 40-fathom stations off Charlevoix, off Manistique, and in midlake between the two ports. The fall overturn was in progress and homothermous conditions prevailed to depths as great as 50 fathoms. Surface water temperatures off Charlevoix were about 11.8° C. (53.2° F.) at the beginning of the cruise and 10.0° C. (50.0° F.) at the end. Extremes recorded in the open lake were 7.0° C. (44.6° F.) and 12.0° C. (53.6° F.).

M/V "Cisco" Cruise 10 (November 21-26, 1961): This short cruise was the last for the 1961 season. The vessel was taken to her new winter berth in Saugatuck, Mich., after the scheduled operations had been completed.

Regular gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch mesh, 100 feet of 2-inch mesh, and 300 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{1}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set overnight at 25, 50, and 80 fathoms off Frankfort, Mich. Catches consisted mostly of chubs (Leucichthys hoyi), alewives, and lake herring at 25, 50, and 80 fathoms. The L. kiyi, L. alpenae, L. zenithicus, and lake herring appeared to be at the beginning of their spawning season. Only one spent fish, a L. kiyi, was taken, but all other individuals of these species were ripe, or nearly so. A

burbot, which weighed 2 lbs. 10 oz., was the second caught by the Cisco this year. It bore no lamprey scars.

The customary data were collected at the 40-fathom hydrographic station off Frankfort. Bathythermograph casts were made at 5-mile intervals from Charlevoix, Mich., to Frankfort. Surface water temperature ranged from 5.8 to 8.9° C. (42.4 to 48.0° F.). Slight thermal stratification still remained at depths greater than about 25 fathoms.

Note: See Commercial Fisheries Review, Jan. 1962 pp. 18-19.

WHITEFISH SPAWNING POPULATIONS ASSESSED IN APOSTLE ISLANDS AREA OF LAKE SUPERIOR:

M/V "Siscowet" Cruise 9: The annual assessment of whitefish spawning activities in the Apostle Islands region was made November 17-22, 1961. Large-mesh gill nets (4½- to 5½-inch mesh) fished at depths of 1 to 4 fathoms on spawning grounds off Rocky and Cat Islands yielded 82 ripe whitefish (71 males, 11 females). Only 1 whitefish was found to bear a sea lamprey scar (healed). Biologists tagged and released 72 of these fish.

The primary reason for tagging the spawning whitefish was to determine whether the fish have a "homing" instinct, i.e., return to the same spawning grounds each year. Over 50 spawning whitefish were tagged on Rocky and Cat Island Shoals in 1960 but none were recovered during cruise 9. (Of the fish tagged in 1960, 22 percent were captured during the year by commercial fishermen.)

Small-mesh gill nets (150 feet each of 1½- and 2½-inch mesh) were also fished on the whitefish spawning grounds. Longnose suckers, round whitefish, and lake herring predominated in the catches. Stomachs from fish of each species were examined, but only the longnose suckers contained fish eggs (presumably of whitefish).

Trawl tows in the Apostle Islands area yielded 82 small lake trout, of which 81 were fin-clipped. Of these hatchery-reared fish, 60 were from the 1961 Bayfield spring plant, 16 from the 1960 spring plant, 3 from the 1960 fall plant, and 2 from the 1959 spring plant. Other species taken in the trawl included smelt, pygmy whitefish, sculpins,

alewives, and sticklebacks. Young-of-the-year alewives were taken in most of the trawl tows, and appeared to be distributed throughout the island area at depths of 17 to 29 fathoms. These catches were of special interest because young-of-the-year alewives had not previously been collected by the Siscowet in Lake Superior.

Water temperatures on the whitefish spawning shoals ranged from 41.0° F. to 42.4° F. The water was nearly isothermal at all depths.

Note: See Commercial Fisheries Review, Jan. 1962 pp. 19-20.



Groundfish

FORECAST OF ABUNDANCE ON NEW ENGLAND BANKS IN 1962:

Little change is expected in the abundance of groundfish on New England fishing banks during 1962. Biologists at the Bureau of Commercial Fisheries Biological Laboratory at Woods Hole, who keep an eye on the fluctuating abundance of the commercially-important species in that area, have this to say for the coming year. Georges Bank haddock, the most important fish in the area, is expected to remain in moderate supply throughout 1962. Scrod will make up a good portion of the catch. This scrod will come mostly from the 1959 age group. The picture for 1963 is not quite so bright for Georges Bank haddock since there are no strong age groups following that of 1959. Bureau surveys indicate a weak 1960 age group and practically no show of the 1961 group.

Other important species such as cod, ocean perch, and whiting are expected to remain moderately abundant as during 1961. Although detailed biological information is not available for those species, as it is for haddock, there is no reason to believe there will be any significant change in their abundance in 1962.

Yellowtail flounder is presently enjoying a high level of abundance. It will remain high during 1962 although there will be a slight drop from the levels of the past two years.

Sea scallops also have been in unusual abundance during the last two years. In 1962 abundance is expected to remain

high, but at levels somewhat below that of 1961.



Gulf Exploratory Fishery Program

EXPERIMENTAL MIDWATER TRAWL TESTED AND SHRIMP AREAS EXPLORED:

M/V "Oregon" Cruise 76: This cruise of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon was conducted in five intermittent phases from September 20 to December 17, 1961. Specific objectives were to: (1) obtain further performance data on experimental midwater trawls, (2) take motion pictures of escapement behavior of various pelagic fishes, and (3) explore the outer shelf areas of the north-central and north-western Gulf for commercial concentrations of brown shrimp (*Penaeus aztecus*).

The phases were planned to permit exploratory shrimp trawling during nighttime periods and midwater trawling trials and underwater motion picture work during daylight hours. A total of 90 shrimp trawl drags and 37 midwater trawl tows were completed during the cruise.

Performance data were obtained on two midwater trawls of different design, various flotation and depressor devices, four corner elevator-depressors, and three different types of doors. Of particular interest was the performance of a trawl of new design, which permitted towing speeds up to 5 knots

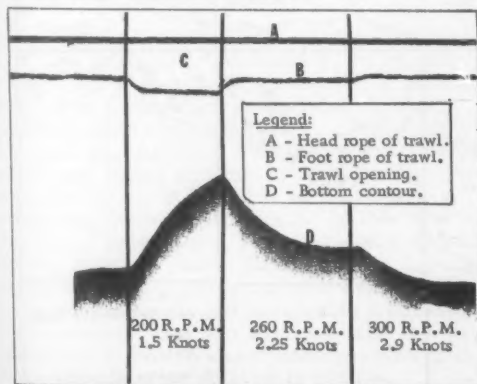


Fig. 1 - British Columbia-Type Trawl: Note inverse relationship between vessel's speed and vertical opening of net.

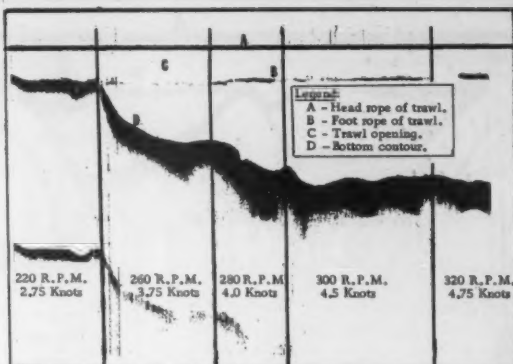


Fig. 2 - Pascagoula High-Speed Trawl: Note stabilized vertical opening of trawl through indicated speed range.

with no apparent reduction in the vertical opening of the trawl. The echographs (figs. 1 and 2) show the relation between speed and vertical opening for both the British Columbia-type trawl and the experimental Pascagoula high-speed trawl.

A headrope-mounted sonic transducer and two remote-controlled motion picture cameras--one mounted on the headrope and one in the funnel--were used to record trawl configuration and fish behavior and to enable exact vertical positioning of the trawl. Approximately 2,000 feet of 16 mm. film were exposed during the cruise, resulting in approximately 500 feet of intelligible film.

Only slight-to-moderate depth-sounder indications of pelagic fish schools were encountered during this period. Midwater trawl catches were generally small, ranging from a few hundred pounds to 1,500 pounds (heads on) per tow. The catches were comprised predominantly of butterfish (*Poronotus triacanthus*) and harvestfish (*Peprilus paru*). The echograph reproduction in figure 3 shows concentrations of butterfish entering the trawl mouth.

At the further request of members of the Gulf shrimping industry, three phases of the cruise were concerned with exploration for brown shrimp in the 20- to 60-fathom depth range both east and west of the Mississippi Delta. This work was a follow-up to earlier shrimp exploratory work which was reported in Oregon Cruise Reports 75 and 76A.

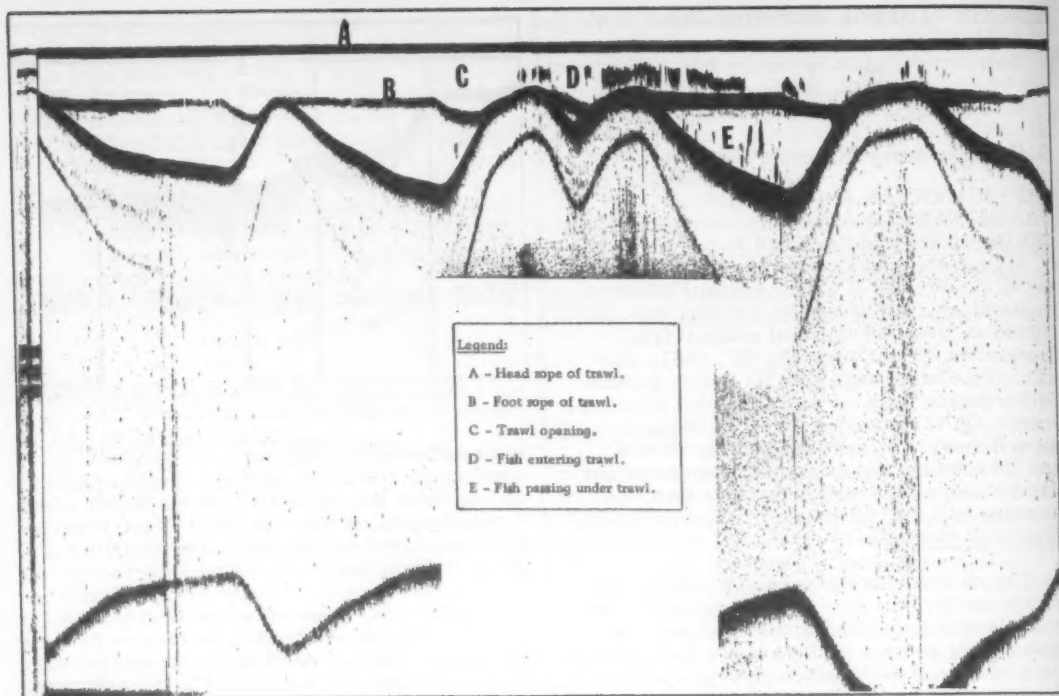


Fig. 3 - Fish entering trawl between head and foot rope of midwater trawl. Apparent uneven bottom contour resulted from variable speeds necessary for positioning trawl to intercept fish schools.



Fig. 4 - M/V Oregon Cruise 76 (Oct. 2 - Dec. 17, 1961).

A total of 90 exploratory drags (85 at night) were completed between the Mississippi Delta and Sabine Pass, Texas, and between the Delta and Pensacola, Florida, in this depth range.

With the exception of three areas which produced marginal commercial catches, no important concentrations of brown shrimp were located. The three areas of marginal production were located: (1) in 18-22 fathoms 20 miles northeast of Pass-a-Loutre whistle buoy #4 (lat. $29^{\circ}33'$ N., long. $88^{\circ}36'$ W.), (2) in 40 fathoms 17 miles east by north of Pass-a-Loutre whistle buoy #4 (lat. $29^{\circ}13'$ N., long. $88^{\circ}37'$ W.), and (3) in 31 fathoms 43 miles WSW. of Ship Shoal whistle buoy #2 (lat. $28^{\circ}24'$ N., long. $91^{\circ}48'$ W.). In these areas drags with a single trawl (40-ft. balloon and 70-ft. flat trawls were used) produced 15-20 count brown shrimp at a rate of 40 to 50 pounds (heads-off) per 3-hour tow. Other areas test-fished produced large brown shrimp at rates of 2 to 5 pounds per one-hour tow.

Extensive areas of foul bottom were found in the 50- to 60-fathom depth range. Most attempts to sample these areas resulted in moderate to severe gear damage. Figure 4 denotes areas of foul bottom and the location of exploratory shrimp drags.

Note: See *Commercial Fisheries Review*, Dec. 1961 p. 31; Nov. 1961 p. 23.



Gulf Fishery Investigations

SEA-WATER LABORATORY DEDICATED:

A new sea-water laboratory, an adjunct to the U. S. Bureau of Commercial Fisheries Biological Laboratory at Galveston, Tex., was dedicated on December 7, 1961. The new facility, together with the recently completed sea water system in the main laboratory, will make it possible to solve many perplexing fishery problems. In the new sea-water laboratory, fish and shellfish will be held in water taken directly from the sea. At the main laboratory the sea water is filtered and recirculated to provide a constant environment. The two systems will enable scientists to set up experiments which will duplicate many conditions in nature.



Fig. 1 - Bureau of Commercial Fisheries new sea-water (continuously circulating) laboratory located on East Beach Lagoon, Galveston, Tex.

In an address at the dedication Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, said: "The ultimate aim of our research here is to discover the biological facts which regulate the survival, growth, movement, and reproduction of shrimp and other estuarine forms. Only through such knowledge can we perceive the means of managing our fisheries for the welfare of the industry and of the Nation..."



Fig. 2 - Inside the new sea-water laboratory showing some of the participants in the dedication ceremonies.

Studies of the sea are extremely difficult. Fish and shrimp are seldom seen near the surface and, therefore, they must be caught by dragging nets blindly across the bottom and bringing them to the surface for observation.

One way to learn more about the species which live in the sea is to create a miniature ocean in a place where direct observations conveniently and safely may be made. This is what has been provided the Galveston Laboratory--a small portion of the sea where fish and shellfish can be kept and their behavior studied to determine the kind of environment which they require.

The Galveston Laboratory is studying shrimp, the most valuable species landed by United States fishermen. Shrimp spawn at sea and their young somehow move shoreward into coastal bays and estuaries. At present, how these tiny shrimp can move such great distances is not fully understood.

This new sea water system will make it possible to rear young shrimp in captivity where they can be studied in minute detail. In this way, it may be possible to determine the effects of tides, currents, and other factors on the movement of young shrimp and to find the clues which will make it possible to solve this mystery.

In other experiments, the Laboratory hopes to improve the methods for marking shrimp and various fish so that their migration can be followed and their survival rates determined.

Construction of this sea-water laboratory is one of the ways in which the Fish and Wildlife Service is participating in the expanded national oceanographic program. Much of the research to be conducted will concern the behavior of fish and shellfish and contribute to our knowledge of these inhabitants of the sea.

Biologists designed this sea-water system with the greatest degree of simplicity to reduce inception and growth of fouling organisms. The sea-water piping is made of strong plastics to prevent metal contamination. The water is first pumped to the 25,000-gallon roof tanks by two 500-gallon-per-minute pumps. Thence, it flows by gravity into the main tank room.

The roof is of prestressed concrete tees to eliminate any pillars in the tank room. Permanent tanks were purposely omitted to provide for maximum flexibility of use, as new experiments require modifications in size and shape of tanks.

The instrument room provides for constant recording of both weather and sea-water characteristics so that investigators will be constantly aware of changing conditions, and a continuous record will be available to apprise the biologists of both short- and long-term trends in any of the physical or chemical characteristics.

TWO VESSELS CHARTERED FOR SHRIMP RESEARCH PROGRAM:

Bids for the charter of two fishing vessels with crews were opened on December 20, 1961. The U.S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Texas, will use the vessels for the expanded Federal shrimp research program under way at the Galveston Laboratory.

The specifications for the vessels were: length 60 feet and maximum over-all length 90 feet. The Government guarantees charter of not less than 35 calendar days for each vessel in each six months of calendar year 1962. Five bids were received.

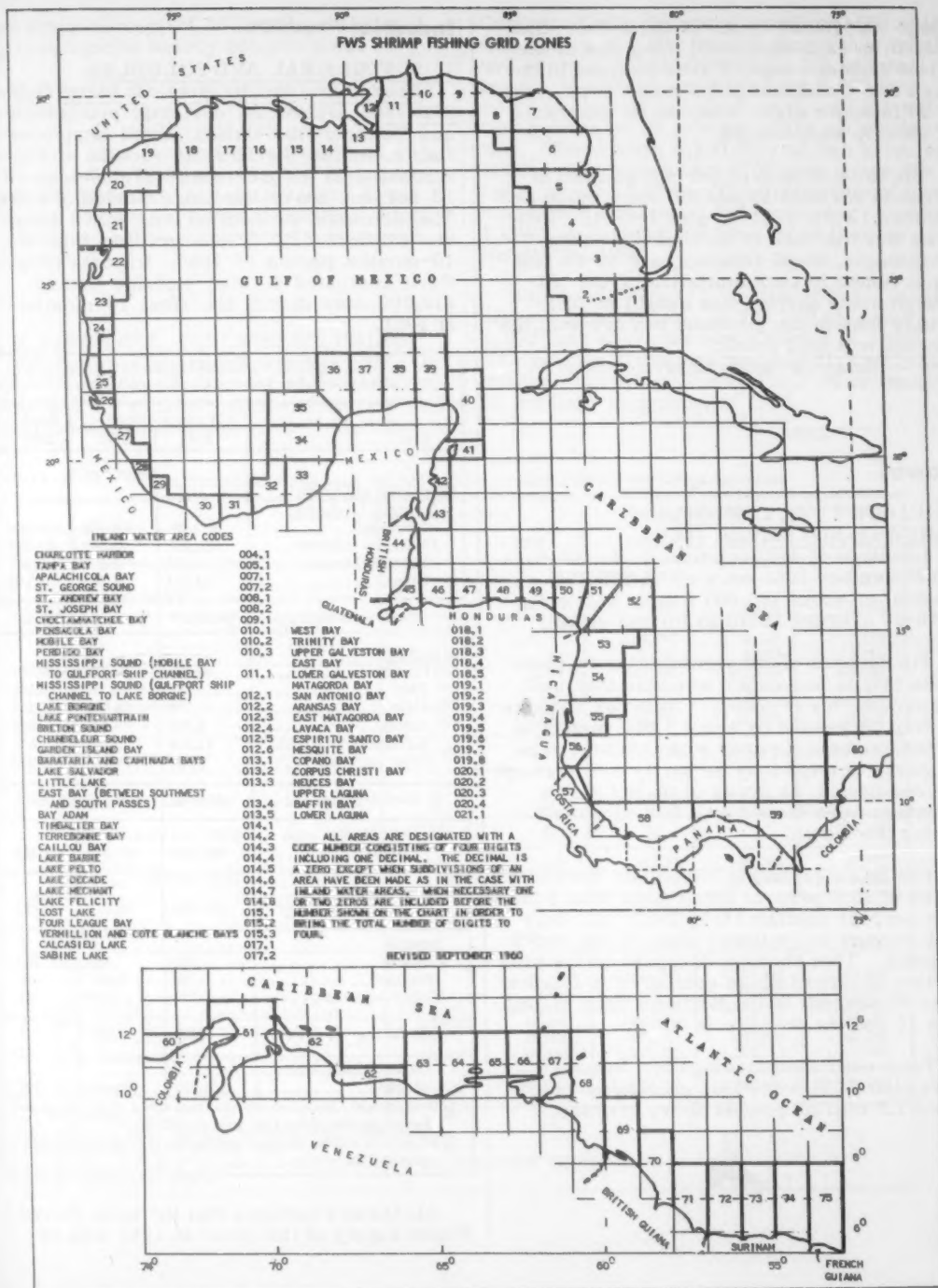
Contracts were awarded to the two lowest bidders for the charter of the Belle of Texas and the Miss Angela. A previous charter contract was awarded to the Belle of Texas in August 1961.

Note: See Commercial Fisheries Review, Oct. 1961 p. 20.

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruises BT-12, BT-13, BT-14: Between December 5 and 7, 1961 (cruise BT-12), 6 tows in each of two statistical areas (FWS fishing grid zone 15 and 16) were made with a 45-foot shrimp trawl by the U. S. Bureau of Commercial Fisheries chartered research vessel Belle of Texas. In each statistical area two tows were made in each of three depth ranges--0-20 fathoms, 20-40 fathoms, and 40-60 fathoms. The vessel is operated by the Bureau's Biological Laboratory in Galveston, Tex. The tows yielded only very small quantities of shrimp.

Ten tows were made between December 15 and 17, 1961 (cruise BT-13), with the same type of gear, in two other statistical areas (FWS zone 17 and 18). Due to rough seas only one station in the 40-60 fathom



range was fished in one of the areas. One station in each statistical area was in the 20-40 fathom range. Three stations in one area and 4 stations in the other were in the 0-20 fathom range. Very small quantities of shrimp were caught.

Six tows in each of the two statistical areas (FWS zone 19 and 20) were made December 18-21, 1961 (cruise BT-14). Two tows were in each of three depth ranges (0-20 fathoms, 20-40 fathoms, and 40-60 fathoms) fished in each statistical area. Although more shrimp was caught on this cruise than in the previous two cruises, the amount was still small.

Note: See *Commercial Fisheries Review*, Jan. 1962 p. 20; Dec. 1961 p. 33.

Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-NOVEMBER 1961:

Landings of skipjack tuna in Hawaii during November 1961 were about 235,000 pounds, or about 100,000 pounds below the 1948-60 average landings for the month.

The number of successful trips by Oahu boats (37) in November was less than half the number for October. Catch per successful trip decreased by about 1,000 pounds in November as compared with October. The decrease in trips may be partly due to rough sea conditions, as small craft and storm warnings were issued on a few occasions during the month.

The landings during November were composed of 35.6 percent small (less than 8 lbs.), 49.6 percent medium (8-15 lbs.), and only 15.1 percent large (more than 15 lbs. each) skipjack. This shows a decrease in the proportion of large fish as compared to October, when 41 percent of the landings were of skipjack 15 pounds or more in weight.

Total estimated landings for January-November 1961 were 11.1 million pounds, about 1.5 million pounds above average.



Industrial Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-October 1961: Based on domestic production and imports, the United States supply of fish meal for the first 10 months of 1961 amounted to 434,100 tons--67,000 tons or 18 percent above the same period of 1960. The domestic production was 8,300 tons and imports 58,700 tons greater than the 10-months period of 1960. Imports from Peru continued to lead--totaled nearly 110,700 tons during the first 10 months of 1961.

U. S. Supply of Fish Meal and Solubles, January-October 1961 and Comparative Data			
Item	January-October		Total
	1961	1960	1960
.....(Short Tons).....			
<u>Fish Meal and Scrap:</u>			
<u>Domestic production:</u>			
Menhaden	230,486	204,184	218,423
Tuna and mackerel . . .	17,191	22,582	26,499
Herring, Alaska	3,576	6,103	6,103
Other	14,244	24,323	39,112
Total production . . .	1/285,497	1/257,192	290,137
<u>Imports:</u>			
Canada	33,559	28,790	30,982
Peru	110,682	54,570	68,156
Chile	10,078	16,672	21,183
Angola	1,543	360	888
Republic of So. Africa . . .	11,376	6,321	7,073
Other countries	1,327	3,135	3,279
Total imports.	168,565	109,848	131,561
Available fish meal supply	434,062	367,040	421,698
<u>Fish Solubles:</u>			
Domestic production 2/	100,021	92,508	98,929
<u>Imports:</u>			
Canada	880	809	869
Denmark	28	1,858	1,858
Other countries	1,710	165	447
Total imports	2,618	2,832	3,174
Available fish solubles supply	102,639	95,340	102,103
1/ Preliminary. Based on reports from firms which accounted for 96 percent of the 1960 total production.			
2/ 50 percent solids. Includes production of homogenized condensed fish.			

All factors indicate that the total United States supply of fish meal in 1961 will ex-

ceed the peak year of 1959 when the quantity amounted to nearly 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-October 1961 totaled 102,600 tons--7,300 tons more than during the same period in 1960. Solubles and homogenized fish manufactured from domestically-caught fish made up 97 percent of the 10 months' supply in 1961, while 3 percent of the supply was imported.

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, January-November 1961: In November 1961, 10,100 tons of fish meal and scrap and 1.4 million gallons of marine animal oils were produced in the United States.

Compared with the same month of 1960, this was a drop of 1,000 tons (9 percent) in meal and scrap and 248,000 gallons (15 percent) in oil. Menhaden accounted for 6,800 tons or 68 percent of the meal total, and 1.2 million gallons or 90 percent of the oil production. There were 4,200 tons of fish solubles produced in November--750 tons above the same month of 1960. The production of homogenized condensed fish amounted to nearly 1,000 tons--about 900 tons more than in November 1960.

During the first 11 months of 1961, meal and scrap production of 276,000 tons was 5,500 tons above the same period of 1960. The marine animal oil yield of 31.9 million gallons was 5.1 million gallons more than in the first 11 months of 1960.

U. S. Production of Fish Meal, Oil, and Solubles, November 1961^{1/} with Comparative Data

Product	November		January-November		Total
	1961	1960	1961	1960	1960
.....(Short Tons).....					
Fish Meal and Scrap:					
Alewife	-	-	89	1,092	1,092
Herring:					
Alaska	-	-	3,576	6,103	6,103
Maine	99	81	1,149	2,693	2,815
Menhaden 2/	6,800	8,357	237,286	212,541	218,423
Sardine, Pacific	697	603	2,094	2,934	3,506
Tuna and mackerel	1,996	1,381	19,189	23,963	26,499
Unclassified	464	664	12,172	20,680	21,288
Total	10,058	11,086	275,555	270,006	279,828
Shellfish and marine animal meal and scrap .	3/	3/	3/	3/	10,309
Grand total meal and scrap	3/	3/	3/	3/	290,137
Fish solubles	4,203	3,453	93,737	86,564	89,377
Homogenized condensed fish	950	71	11,437	9,468	9,552
.....(Gallons).....					
Oil, body:					
Alewife	-	-	6,900	73,950	73,950
Herring:					
Alaska	-	-	625,786	1,385,218	1,385,218
Maine	4/	2,680	4/	132,973	132,973
Menhaden 2/	1,223,646	1,515,864	29,461,595	23,497,283	24,453,736
Sardine, Pacific	20,923	15,184	58,166	138,611	160,121
Tuna and mackerel	85,091	46,031	671,951	459,877	509,195
Other (including whale)	30,173	28,464	1,057,039	1,108,727	1,137,782
Total oil	1,359,839	1,608,223	31,881,437	26,796,639	27,852,975
^{1/} Preliminary data. ^{2/} Includes a small quantity produced from thread herring. ^{3/} Not available on a monthly basis. ^{4/} Included in "Other" in order to avoid disclosure of the production of individual firms. Note: Excludes liver oils.					

Imports of fish meal during January-October 1961 of 168,900 tons were 54 per cent greater than during the same period of 1960. Imports of fish solubles were 200 tons less. Exports of fish oils and fish liver oils during the first 10 months of 1961 amounted to 110.6 million pounds (14.7 million gallons)--2.6 million pounds (350,000 gallons) less than in the same period of 1960.

MAJOR INDICATORS FOR U. S. FISH MEAL, SOLUBLES, AND OIL, DECEMBER 13, 1961:

Fish Meal Production and Imports				
Item and Period	1961	1960	1959	1958
.....(Short Tons).....				
Production:				
December	1/	9,185	14,361	14,636
November	10,500	8,725	10,797	9,749
January-November 2/	276,000	251,211	261,015	201,536
January-December *	1/	257,969	275,396	226,299
January-December **	1/	290,137	306,551	248,140
Imports:				
December	1/	15,564	5,538	8,490
November	1/	6,149	3,673	6,082
October	9,425	12,515	3,821	5,899
January-October ..	168,565	109,848	123,744	85,780
Jan.-Dec. Totals ..	1/	131,561	132,955	100,352
Fish Solubles Production and Imports				
Item and Period	1961	1960	1959	1958
.....(Short Tons).....				
Production 3/:				
December	1/	2,897	5,430	6,305
November	4,000	3,542	4,628	8,888
January-November ..	93,500	96,032	159,929	123,872
Jan.-Dec. Totals ..	1/	98,929	165,359	130,177
Imports:				
December	1/	50	420	5,180
November	1/	282	3,089	867
October	110	-	1,908	2,548
January-October ..	2,618	2,832	23,121	6,520
Jan.-Dec. Totals ..	1/	3,174	26,630	14,567
Fish Oil Production and Exports				
Item and Period	1961	1960	1959	1958
.....(1,000 Gallons).....				
Production:				
December	1/	1,038	1,865	1,839
November	1,346	1,202	1,147	1,028
January-November ..	32,000	25,643	22,546	19,786
January-December *	1/	26,690	24,418	21,957
Jan.-Dec. Totals **	1/	27,686	24,978	22,028
Exports:				
December	1/	2,108	2,611	383
November	1/	1,952	813	2,037
October	2,027	591	1,911	3,591
January-October ..	14,744	15,095	15,840	10,119
Jan.-Dec. Totals ..	1/	19,155	19,264	12,539

1/Not available.

2/Does not include crab, shrimp, and miscellaneous meals.

3/Includes homogenized fish.

4/Represents over 95 percent of the total production.

Note: Data for 1961 are preliminary.

*Totals based on preliminary monthly data.

**Final annual totals.



North Pacific Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER:

M/V "Commando" Cruise 3: The third in a series of cruises designed to monitor deep-water marine fauna at stations established along a track line southwest of the mouth of the Columbia River was completed on December 13, 1961, by the U. S. Bureau of Commercial Fisheries chartered fishing vessel Commando. Inclement weather prevented a systematic survey of the stations from shallow to deep areas as in previous cruises; however, adequate coverage was obtained from 12 otter-trawl hauls made in 50 to 450 fathoms of water.

The cooperative study with the Oregon Fish Commission of Dover sole migrations was continued with release of 70 tagged fish at the 300-fathom station.

Commercial species of fish encountered were the same as those taken in previous cruises, including sablefish (Anoplopoma fimbria), Dover sole (Microstomus pacificus), English sole (Parophrys vetulus), petrale sole (Eopsetta jordanii), turbot (Atheresthes stomias), hake (Merluccius productus), and several species of rockfish. Dover sole and sablefish were found throughout the depth range fished. Dover sole was most abundant between 200 and 300 fathoms, while most of the sablefish were taken between 300 and 400 fathoms. Although as much as 1,300 pounds of sablefish per hour tow were caught, a large percentage of the take was under marketable size. The largest catch of ocean perch (Sebastes alutus) was made at 150 fathoms. Very few hake were taken during the survey which is in contrast to the September cruise when large concentrations were found down to a depth of 200 fathoms.

Tanner crabs (Chionoecetes tanneri) appeared in greatest abundance at 375 fathoms where 360 pounds were taken in a one-hour tow. One male tanner crab was caught in 150 fathoms which is 100 fathoms shallower than any of either sex taken in previous cruises.

Invertebrates encountered during the cruise and not in previous cruises were barnacles and a species of crab similar in appearance to a king crab.

Note: See Commercial Fisheries Review, Nov. 1961 p. 26.



Oceanography

ALUMINUM SUBMARINE FOR OCEANIC RESEARCH:

An aluminum research submarine designed to explore the ocean at depths many times beyond the limit of existing subs is being built for Reynolds International, Inc., by General Dynamics Corporation's Electric Boat Division, according to a joint announcement by the two firms.

The Chairman of Reynolds International, Inc., a subsidiary of Reynolds Metals Company, and the Chairman of General Dynamics on September 27, 1961, announced the signing of a \$2-million design and construction contract for the Aluminaut--first submarine ever to be constructed from aluminum.

The Woods Hole Oceanographic Institution (Massachusetts) will operate the sub as part of a research program sponsored by the Office of Naval Research (ONR), United States Navy. Most of the construction costs incurred by Reynolds will be recovered through lease of the craft for oceanographic research.

The Aluminaut is being built at the Electric Boat Division in Groton, Conn., and launching is scheduled for 1963. A pioneer in submarine construction, General Dynamics has built 10 of the Navy's 21 commissioned atomic subs. These include the Nautilus, first nuclear sub, and the George Washington, first of the Polaris subs.

Designed to operate at depths of 15,000 feet--almost three miles down--the Aluminaut will permit man to explore about 60 percent of the world's ocean floor--most of it for the first time.

The Aluminaut is scheduled to be equipped with sonar, television cameras for detailed observation of the ocean floor, and robot hands to obtain specimens.

Displacing 150,000 pounds, the Aluminaut will be slightly over 50 feet long with an 8-foot diameter hull. Separate electrical propulsion systems will give the three-man craft both horizontal and vertical locomotion. Its operating range will be about 80 miles.

The sub's hull is being constructed by bolting together large, one-piece cylindrical sections of high-strength aluminum forgings.

The world's largest aluminum ingot was cast for the first hull section.

Aluminum was chosen because it is three times lighter than steel and has greater strength for its weight than other available metals. This allows fabrication of a hull thick enough to withstand tremendous pressures at great depths, yet light enough to stay afloat without external buoyancy.

The Director of Woods Hole Oceanographic Institution said: "We plan to use the Aluminaut to extend our capabilities for a wide variety of geological, biological, and physical research work on the bottom and in the mid-depths. Among the subjects our scientists will study are the submarine canyons, the edge of the continental shelf, and the daily vertical migration of marine animals."

The Aluminaut is the outgrowth of research which has been carried out for several years by Reynolds Metals Company, Southwest Research Institute, General Dynamics' Electric Boat Division, Woods Hole Oceanographic Institution, and the Office of Naval Research.

NEW EDUCATIONAL FILMSTRIP "DEEP FRONTIER--AN INTRODUCTION TO OCEANOGRAPHY":

A limited number of copies of "Deep Frontier--An Introduction to Oceanography," a narrated color filmstrip designed particularly for high school and university science classes, is being offered by the U. S. Department of the Interior without charge to State education departments and interested institutions of higher learning, the Department announced on December 27, 1961.

The filmstrip was produced recently with technical and financial support from the Fish and Wildlife Service's Bureau of Commercial Fisheries in efforts to influence young people to choose careers in oceanography and marine biology.

"Deep Frontier" explains the importance of oceanography--the study of the last great frontier of our planet--and imaginatively portrays developments that may take place in the future. With only about one thousand oceanographers in the United States, the need for scientists in this field is increasing rapidly.

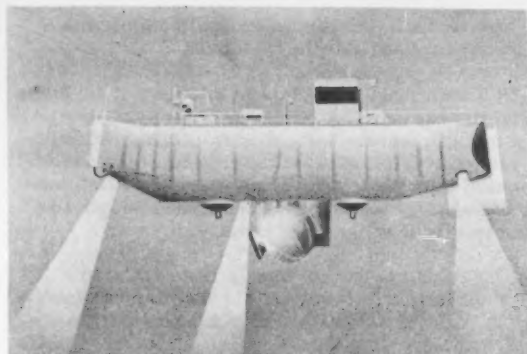


Fig. 1 - For direct explorations of the deeps of the ocean we now have the bathyscaphe from which man can study the ocean directly, watch living creatures in their natural environment and collect unusual specimens.

"Oceanography offers a challenging call to those who would venture into the unknown, for, truly, the oceans are the unknown," the filmstrip comments.



Fig. 2 - Only a few years ago soundings were made by dropping long weighted lines. Now soundings are made from ships by acoustic signals that echo off the bottom. The echo time-interval, and thus the depth, is recorded automatically on moving graph paper.

"Deep Frontier" is recorded either for synchronized projection or manual operations and runs 17 minutes. Interested teachers or schools should arrange with their State education departments' audio-visual instructors for free loan of the filmstrip. Colleges and universities should write to the Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

Oregon

FISH COMMISSION HAIR SEAL HUNTING CONTRACT TO BE RENEWED:

"The Oregon Fish Commission's seal control activities in the lower Columbia apparently have been paying off," the State Fisheries Director stated early in January 1962. "Bounty payments to free-lance seal hunters are down from previous seasons," he said, citing the smaller numbers of bounty claims during the past two years as one indication of reduced seal numbers.

"Losses of salmon through the depredations of the common harbor or hair seal are believed to have assumed substantial proportions during some seasons. Fewer seals have been sighted in the river, and reports of losses to the marauding animals of salmon from the nets of commercial fishermen have been less common since a seal hunter was employed two years ago," the Fisheries Director added.

The occasion for the observations was the pending renewal of the seal hunting contract for the lower Columbia River area, let annually to cover the following 12 months. Under terms of the current agreement, the Commission's contract seal hunter must provide all equipment necessary for the job. Compensation is made for each day of actual hunting. During the past two years, a thoroughly qualified hunter of long experience has held the contract. Under terms of the contract, the hunter must be available for seal control work at all times. This fact makes it impractical for a seal hunter to combine fishing with seal control activities.

Funds for the contract control activities, as well as for bounty payments to free-lance seal hunters, are derived from special fees paid by both Columbia River gill-netters and packers. The money is earmarked specifically for Columbia River seal control. During the past seven years, an average of 69 seals has been submitted annually for bounty. The Commission pays a \$25 bounty for each seal carcass turned in to an authorized agent of the Fish Commission and certified as having been killed in the specified Columbia River area.



Oysters

LONG ISLAND SOUND SPAWNING AND SETTING OBSERVATIONS, SUMMER 1961:

Studies in the past summer of 1961 completed a quarter of a century of systematic observations on the spawning and setting of oysters in Long Island Sound by the Milford (Conn.) Biological Laboratory of the U. S. Bureau of Commercial Fisheries. These observations, which began in 1937, probably present the longest uninterrupted study of propagation of the American oyster, *Crassostrea virginica*, and of the ecological factors controlling it. Various aspects of the studies, contributing to the management of shellfisheries, have already been published.

The number and location of the stations (observation and sampling areas) established for these studies in the oyster-producing section of Long Island Sound varied from year to year depending upon the circumstances. In some years the chain of stations extended from the Thimble Islands to the Norwalk Islands, thus covering a distance of about 35 miles along the Connecticut shore. However, during the last 20 years the observations were principally concentrated at ten basic stations. These stations were established at different depths in the New Haven, Milford, and Bridgeport areas where most of the important oyster beds are located.



Fig. 1 - Oyster Set Collector Unit: (1) bag made of chicken mesh wire containing approximately 40 clean oyster shells. Newly set oysters are counted only on the inside clean surface of these shells; (2) chicken wire bag filled with rocks to serve as anchor; (3) tared rope; (4) auxiliary float helps to maintain rope in vertical position; (5) surface float indicating position and number of collector. As a rule, two shell-filled bags (1) are placed at each station where observations on time and intensity are made.

Spat collectors, used to catch and record the set, were usually placed in the water long before setting of oysters was expected to begin. This was done because the same collectors were also used for observations on setting of starfish which, as a rule, begins 2 or 3 weeks prior to the beginning of oyster setting. The collectors were changed twice a week being always replaced by new, unused duplicates. Recovered bags were brought to the laboratory where the shells were examined and the number of set counted under low-power microscopes. The research boat *Shang Wheeler* was used in these studies, as well as in routine observations on the conditions in Long Island Sound, including examination of cultch (loose shells) planted by oystermen on commercial beds.



Fig. 2 - U. S. Bureau of Commercial Fisheries research boat and floating laboratory *Shang Wheeler* used by Milford Laboratory biologists in their work in Long Island Sound and adjacent waters.

Prior to the beginning of setting the biologists studied the condition of the parent oysters and the degree of ripeness of their gonads. After the beginning of spawning, microscopic forms, present in sea water and called "plankton," were collected at several chosen stations. Oyster larvae, which are minute free-swimming organisms, constitute part of the plankton. The type and number of organisms of the plant and animal groups found in the samples helped the scientists to anticipate the biological events that were to follow. Routine observations on temperature and salinity changes of the water at the collecting stations were also made.

Plankton studies early in the 1961 season indicated that, as demonstrated by the presence of numerous young larvae in the water

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samples, spawning of oysters began as usual. However, somewhat later, bivalve larvae at most of the stations became scarce or virtually entirely absent. This phenomenon coincided with a heavy bloom of dinoflagellates, a name given to microscopic forms which cause the so-called "red water." Several years ago, on the basis of laboratory experiments with "red water" organisms, we suggested that the products of their metabolism discharged in the surrounding water unfavorably affect oyster eggs and young larvae. We presume, therefore, that under natural conditions the external metabolites of dinoflagellates, represented last summer principally by *Prorocentrum micans*, certain species of *Gymnodinium*, and related forms, also affected the development of oyster eggs and larvae.

Dinoflagellates were present in extremely large numbers until approximately August 10. After that the water of Long Island Sound became considerably clearer but, because "red water" organisms had been prevalent during a large part of the oyster setting season, they had already caused damage.

The first set was recorded on July 21. At the basic stations setting was first observed on July 29, simultaneously at Stations 2, 4, 5, 6, and 7. This was a very light setting, indicating that only a few larvae managed to survive. During the next two weeks the intensity was even lighter, and during the week of August 12-18 setting was recorded only at Station 6.

Between August 19 and 25 setting of a more general nature was recorded in all three major areas of observation. The peak took place between August 26 and September 1, setting being recorded at all stations except Station 10. After this peak the intensity of setting sharply declined and after September 8 some stations caught no new set whatsoever. The last set of the season found at any of the stations, basic or auxiliary, was recorded on October 7 at Station No. 1.

On a percentage basis, approximately 8 percent of the season's total set took place during the week of July 29-August 4. Setting during the next week constituted about 2 percent of the season's total, and in the following week, only about 0.2 percent. The week of August 26-September 1, representing the peak of setting, accounted for approximately 54 percent of the total set. During the week

of September 2-8 it decreased to 14 percent and the following week, to approximately 2.5 percent. In general, over 80 percent of the season's total set was confined to a three-week period, beginning August 19 and ending September 8, 1961.

A comparison of the intensity of setting at the ten stations showed that Station No. 5, located on the State spawning bed in New Haven Harbor, occupied first place. Station No. 6, also located in New Haven Harbor and not too far from Station No. 5, ranked second, although considerably lower in intensity than Station No. 5. A disappointing feature of the season was that Station No. 10, which for years ranked as the most promising set-producing area, was one of the poorest. Considering the recent history of this station several oyster companies, early in the summer, planted large numbers of shells in its vicinity but, unfortunately, their efforts met with failure.

Considering the combined set of the ten stations as 100 percent, the season's set at Station No. 5 constituted 45.42 percent of the total. Station No. 6 produced 15.14 percent and Station No. 4, 8.53 percent. All these stations are located in New Haven Harbor. Station No. 10, however, received only 1.49 percent of the total set, thus being only slightly higher than the two lowest stations, 3 and 7.

We cannot offer a satisfactory explanation for the variations, or, in some instances, stability from year to year in the relative productivity of the stations in different areas. Many reasons and, of course, speculations can be advanced, most of them unfortunately, unverified. Nevertheless, there is little doubt that the intensity of setting at all stations depends, to a considerable extent, upon the inshore system of minor water currents. These currents are usually well defined and are of a rather definite pattern but, nevertheless, in some instances, their directions may so change that the larvae will be carried away and metamorphose in other areas.

The second assumption, why setting at Station No. 10 was a failure, is that the oyster bed from which the larvae populating this station normally originated, was destroyed or that spawning there was a failure, and therefore, no larvae, or very few of them reached maturity and set at or near that station.

As already mentioned, the observations on time and intensity of oyster setting in Long Island Sound were carried on for 25 years. During this period settings poorer than in 1961 were recorded only on three occasions, i.e., 1943, 1954, and especially 1957, which was virtually a complete blank. The 1961 set, therefore, contributed very little to the oyster population of Long Island Sound and to the New England oyster industry in general.



Fig. 3 - Biologists of Milford Biological Laboratory counting seed oysters on culch dredged from oyster beds located in different parts of Long Island Sound. Simultaneously with counting of set, condition of young oysters is noted, as well as presence or absence of their enemies and competitors.

Considering that the oyster reserves prior to the setting of 1961 were extremely low and that the starfish set in the summer of 1961, although not too heavy, survived and grew extremely well, significantly adding to the already existing starfish population, the situation of the Connecticut oyster industry is critical and all possible measures should be taken to save it from total destruction. We strongly believe that the application of hatchery methods for the production of seed oysters, which have been developed and perfected largely at the Milford Laboratory, and use of chemical methods to control oyster enemies as soon as they are approved by the Food and Drug Administration, may be the decisive measures in helping to reverse this critical situation. These measures will help to recreate a new healthy aquatic industry guided by scientific principles and newly acquired knowledge. In other words, the progress of aquaculture should resemble that of agriculture and animal husbandry which is still advancing because of the proper application of scientific discoveries

made in the fields of genetics, pest control, and a better understanding of the physiological and ecological requirements of terrestrial plants and animals.

Note: For a more detailed report, write to Milford Biological Laboratory for a free copy of "Bulletin No. 9."

- V. L. Loosanoff,
Laboratory Director,
Biological Laboratory,
U. S. Bureau of Commercial Fisheries,
Milford, Conn.



Research Grants

FELLOWSHIP GRANTS TO BE AWARDED FOR FISHERIES RESEARCH:

Launching of a new program of fellowship grants in the field of fisheries and oceanographic research was announced on December 22, 1961, by the U. S. Department of the Interior. Invitations to participate in the program were sent early in January 1962 to qualified educational institutions. Approximately 15 two-year fellowships will be awarded in 1962 from appropriated funds totaling \$200,000.

With this program, the Department said, the Fish and Wildlife Service's Bureau of Commercial Fisheries "hopes to attract and assist the scientific manpower necessary to further its objectives for the Nation's welfare and thus aid the advancement of the overall aims of the National Oceanographic Program, particularly in the field of fishery research.

A panel of six representatives of universities and private research institutes met with Department officials to advise on rules, policies, and procedures for making the grants and the scope of research areas to be covered.



Sharks

INTERIOR DEPARTMENT REPORTS ON ATLANTIC SHARK AND GAME FISH STUDY:

A total of 311 sharks was taken in a recent two-months research project coordinated by the U. S. Fish and Wildlife Service in the Middle Atlantic Bight, the U. S. Department of the Interior reported on December 18, 1961. The study was undertaken to determine the abundance and food habits

of sharks in the area and to serve as a pilot survey extending from Long Island to Cape Henlopen, Del., and seaward to the edge of the Continental Shelf, of oceanic conditions affecting the distribution and abundance of marine game fishes.

Results showed there were more large sharks in the area than anticipated, suggesting that important relationships of sharks to environmental conditions and to sport fishing may exist.



Dusky shark being gaffed aboard a research vessel.

The 311 sharks taken represented 10 species, 7 of which have reputations of being dangerous to man--the great white shark, mako, tiger, sandbar, dusky, and two species of hammerhead. The largest specimen, a 12-foot tiger shark, weighed 1,100 pounds. The smallest shark weighed 1.5 pounds.

Several big game fish were taken: albacore, bluefin, and yellowfin tunas; dolphin, swordfish, and white marlin. The largest was a 247-pound yellowfin.

Examination of the shark stomachs indicated the sluggish species fed upon bottom-dwelling fish, but the swiftly swimming great white shark and the mako fed upon bluefish and other active fish. Garbage, such as fish heads, beef cuttings, and bacon and sausage, was eaten. Even aluminum foil was consumed. Chumming material used to entice sport fish to the vicinity of fishing boats was found, as well as waste which could only have come from ocean-going vessels or from garbage scows.

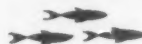
Eight 3- to 5-day cruises were made between August 13 and October 13. Three types of gear used were long lines, two to 10 miles in length; 1,500-foot gill nets; and 2,000-foot chain gear set for bottom fishing.

Shark catches declined when surface water temperatures went down in late September and early October. Continuous

surface temperature recording was maintained on all cruises and 300 surface-to-bottom temperature profiles were obtained. Over 1,000 surface-drift bottles and bottom-drift indicators were released, and 300 water samples were taken for laboratory examination for salinity and other chemical constituents.

The 1961 research was planned and coordinated by the Sandy Hook (New Jersey) Laboratory of the U.S. Bureau of Sport Fisheries and Wildlife. Agencies cooperating in the project included the U.S. Bureau of Commercial Fisheries; the Delaware Game and Fish Commission; Lamont Geological Observatory of Columbia University; New Jersey Conservation Department; the Aquarium of the New York Zoological Society; and the United States National Museum, Washington, D. C.

It was the first cooperative study of its kind and may serve as a basis for similar studies along the coasts, the Fish and Wildlife Service said.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS AS OF DECEMBER 31, 1961:

Item and Period	1961	1960	1959	1958	1957
(all heads-off)(1,000 Lbs.)				
Total Landings, S. Atl. & Gulf States:					
December	6,600	7,097	8,716	8,099	6,718
November	9,800	14,454	12,412	12,416	9,302
January	5,688	4,800	4,310	5,254	6,220
January-December ..	92,045	141,035	130,659	116,552	116,238
Quantity used for Can-					
ning, Gulf States 1/:					
December	800	977	1,278	1,943	882
November	2,300	1,614	2,312	3,424	953
January	199	289	308	146	114
January-December ..	15,737	28,594	24,679	26,404	18,386
Frozen Inventories (as					
of end of each month) 2/:					
December	19,975	40,913	37,886	32,844	21,719
November	20,608	37,264	37,334	30,211	22,326
October	17,811	31,209	33,057	24,620	20,362
January	37,842	34,332	30,858	17,963	15,074
January-December,					
monthly avg.	23,186	25,054	27,297	18,008	13,627
Imports 3/:					
December	4/	12,411	10,611	10,447	6,865
November	14,852	13,516	10,269	10,617	6,789
October	16,813	14,211	15,340	11,463	9,237
January	12,338	8,596	8,238	5,696	5,679
January-November ..	110,840	101,007	95,944	74,946	62,812
January-December ..	4/	113,418	106,555	85,394	69,676

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 33.

2/Raw headless only; excludes breaded, peeled and deveined, etc.

3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

4/Not available.

Note: Data for 1961 are preliminary. December 1961 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.69.



South Atlantic Exploratory Fishery Program

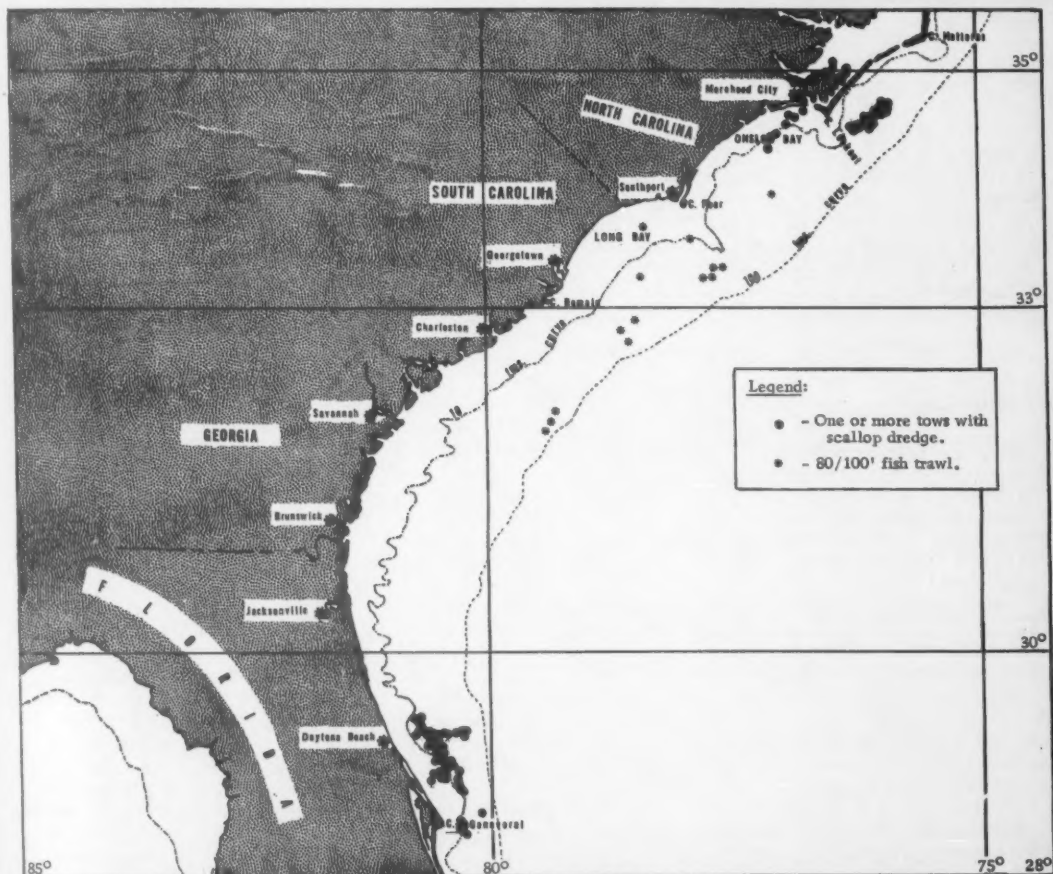
EXPLORATORY FISHING FOR CALICO SCALLOPS AND SNAPPERS:

M/V "Silver Bay" Cruise 35 (November 28-December 15, 1961): Exploratory fishing for calico scallops and snappers was the purpose of Cruise 35 by the M/V Silver Bay of the U. S. Bureau of Commercial Fisheries. The vessel returned to Brunswick, Ga., December 16, 1961, after the 18-day cruise between Cape Canaveral, Fla., and Cape Lookout, N. C.

The first portion of the cruise was devoted to additional calico scallop dredging

on the Cape Canaveral bed, with the majority of the fishing effort taking place in the northern section extending from Cape Canaveral to Daytona Beach. The second portion of the cruise was devoted to bottom trawling explorations between Cape Lookout and Savannah, and scallop explorations in an area near the Core Banks calico scallop bed.

Off Daytona Beach catches of calico scallops ranged up to 30 bushels per 30-minute drag using an 8-foot tumbler dredge. In this general area, commercial catches were made consistently for 20 miles from west to east and for 30 miles from south to north in the 13- to 16-fathom depth range. The best catches were made in $14\frac{1}{2}$ fathoms where the scallops were predominantly large (50 to



M/V Silver Bay Cruise 35 (Nov. 28, 1961 to Dec. 15, 1961).

65 mm. in width) and in prime condition. Meats ranged from 80 to 120 count per pound. The largest catches were comprised of less than one percent of trash and sorting was therefore unnecessary.

Twenty-seven drags on the scallop bed off the Core Banks Bed previously defined by the M/V Silver Bay produced catches only as high as 0.8 bushel per 30-minute drag. Shell size was large (60 to 70 mm. in width) and the meats were fair to poor. There was no evidence of a high mortality (large amounts of dead shell) or replacement stock (small seed scallops).

Fourteen drags using an 80/100 roller-rigged fish trawl with funnel flappers were made between Cape Lookout and Savannah. One 1,477-pound catch at 33°15' N., 77°51' W., included 550 pounds of large (16"-18") vermilion snapper (Rhomboplites aurorubens). Other catches ran as high as 2,195 pounds of mixed fish per 90-minute drag and were usually composed of varying amounts of tomtate (Bathystoma aurolineatum), scup (Stenotomus), porgy (Pagrus and Calamus), grey triggerfish (Balistes capriscus), and grouper (Mycteroperca). Small amounts of large croakers (Micropogon undulatus), porgy, grouper, and red snapper (Lutjanus blackfordi) were taken off Savannah in 35-50 fathoms.

Note: See Commercial Fisheries Review, Jan. 1962 p. 29.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, OCTOBER-DECEMBER 1961:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for October-December 1961:

Oyster Research: Research was continued on the use of solite as a substitute cultch for oyster cultivation. Thus far this material has not compared favorably with South Carolina steamed shell. Since this experiment began when spatfall was approaching the bottom of its annual curve, the study will have to be continued in the spring of 1962 when young oysters are again setting on cultch.

Studies on the spawning and setting season for oysters was completed in mid-October. These studies indicated a relatively heavy oyster set during the 1961 season.

A state-wide survey was conducted to determine the degree to which oysters are infested by the sporozoan parasite Nematopsis ostrearum. This pest of oysters is not harmful to man and, actually, seems of little consequence to oysters. From samples taken throughout the State, there seems to be little correlation between the relative abundance of this pest and water temperatures, salinities, or elevation of the oysters in relation to the low-water mark.

In connection with the mapping of oyster beds under lease in South Carolina being carried on as a joint program by Laboratory and the State's Division of Commercial Fisheries, the Laboratory has put special emphasis on locating and mapping subtidal oyster beds. These are extremely rare in South Carolina waters, but appear to have increased in extent in the past few years. This is coincident with an increase in annual rainfall. The resulting lowered salinities had served to hold and check infestation of oysters by boring sponges, one of the most serious pests of oysters in the State. However, a decided lack of rainfall in the past quarter has raised salinities, and the boring sponge is again very prevalent on subtidal beds.

Shrimp Research: Shrimp survey records are now complete through December of 1961. These records show that during October-December 1961, white shrimp were approximately 53 percent less abundant at experimental stations as in that period in 1960. Both white and brown shrimp were very scarce throughout 1961 as compared with 1960, as white shrimp decreased by over 50 percent and brown shrimp declined in abundance by more than 70 percent at shrimp survey stations. The average catch per unit of effort for both species of shrimp in experimental trawling was 59 percent less in 1961 than in 1960.

The scarcity of shrimp in 1961 has also been evident in the commercial catch of South Carolina, which was more than 50 percent below that of 1960 as of November 1. A similar situation exists all along the South Atlantic and Gulf Coasts, and it is most likely that the decrease in abundance of commercial shrimp this year is due to natural conditions. Quite possibly some natural occurrence, such as excessive mortality of the brood stock of shrimp left over from 1960, prevented successful spawning this year. It is known that postlarval shrimp were very scarce in inshore

waters this year, since minimal numbers were taken in plankton tows at experimental stations.

Five new experimental stations were added to the shrimp survey program during the quarter. These stations extend northward from the Laboratory and beyond Charleston. Establishment of these stations expands the area formerly covered by the Laboratory's shrimp survey, and it is felt that experimental work at those locations will provide valuable additional information on the biology of marine life in South Carolina.

Fish: In this quarter the experimental trawl hauls made at the regular established stations in South Carolina showed that the average catch per unit of effort of whiting and croaker was almost identical with that of the same quarter in 1960. Spot, on the other hand, showed a decline of over 50 percent.

Crabs: Of the blue crabs taken in experimental trawls, the young and immature crabs showed no change during the time of this report, but mature crabs were about 30 percent less abundant as compared with 1960.

Note: See Commercial Fisheries Review, Sept. 1961 p. 45.



Tagging

BRIGHT COLORS AID TAG RECOVERY:

A total of 1,000 7-inch herring were tagged in Eastern Penobscot Bay, Maine, during October. In addition to the fish tagged with the bright yellow tag, equal numbers of



fish tagged with dark green and scarlet tags were released to determine if color had any effect upon tag recovery. To date yellow has proved five times more effective than green. No scarlet tags have been recovered.

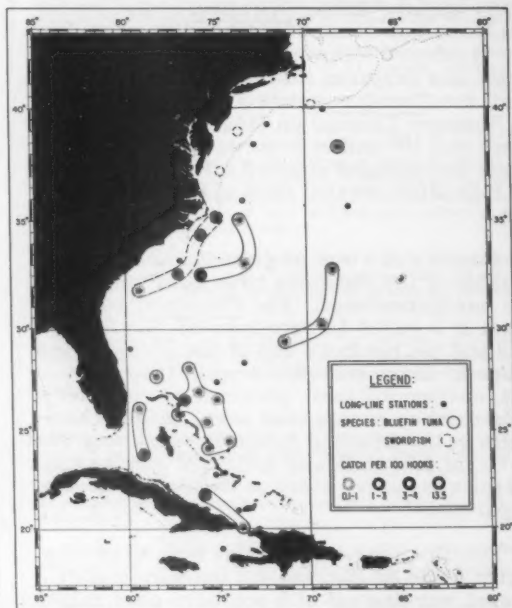


Tuna

MIGRATIONS IN NORTH ATLANTIC STUDIED BY R/V "CRAWFORD":

A significant number of tuna were caught in the North Atlantic in April-May 1961 by the research vessel Crawford of the Woods Hole Oceanographic Institution. Important new information on the distribution and spawning of large pelagic fishes was provided by this cruise of the research vessel.

Long lines were used to fish the area from Cape Cod to Jamaica and back between April 19 and June 8, 1961. A total of 38 sets (15,730 hooks) were made, mostly in areas which had not been explored in this manner at that time of year.



Cruise 62 of R/V Crawford, April 19-June 8, 1961, showing location of long-line stations and catches of bluefin tuna and broadbill swordfish only.

The take numbered 60 bluefin tuna, 33 yellowfin tuna, 13 albacore tuna, 3 blackfin tuna, 2 skipjack tuna, 13 broadbill swordfish, 12 blue marlin, 39 white marlin, 6 sailfish, 11 wahoo, 151 dolphin, 57 miscellaneous fish, and 174 sharks.

The most significant results concerned the bluefin tuna (*Thunnus thynnus*) and the

swordfish (*Xiphus gladius*). Catches of giant bluefin nailed down a migratory route of the fish into the Bimini-Cat Cay area where they appear regularly late each spring; evidence was also obtained of a similar run along the eastern or Atlantic side of the Bahama Islands. Swordfish were taken in an area where their presence had not been suspected--in the Gulf Stream between Charleston, S. C., and Cape Hatteras.

The route by which the giant tuna reach the Bimini-Cat Cay area has long been a subject of speculation. In recent years vessels of the U. S. Fish and Wildlife Service have found concentrations of bluefin in the Windward Passage in late April and in the Gulf of Mexico through the late winter and early spring. In the Crawford cruise strong evidence was found of a migration route from the Windward Passage through the Old Bahama and Santaren Channels to Cat Cay. In fact, the Crawford made a very heavy catch in Santaren Channel on May 22; two days later and 100 miles to the north the Cat Cay Tuna Tournament enjoyed a record catch of 44 fish after several days of very poor fishing.

Rumors of a run of giant tuna along the outside of the Bahamas have been persistent but unsubstantiated. The Crawford caught them in 9 out of 10 sets between San Salvador and the northern end of the group, some close to shore and others up to 100 miles out, confirming their presence in considerable number over a vast area. Negative results in the Crooked Island Passage and west of Great Inagua Island indicated that the runs on the respective sides of the Bahamas are separate.

Detailed long-line studies of both groups, which could be carried out from a smaller vessel working out of a southern port, might clarify the duration, geographical extent, and volume of the migrations.

Some idea of the tuna route north from the Bahamas was obtained in 12 sets made up the coast as far as Hudson Canyon--they were taken only in sets east of the Gulf Stream, not in the stream or west of it. Another group of giant bluefin further out in the Atlantic was suggested by catches at each of three stations west and southwest of Bermuda.

The swordfish catches were an important and unexpected new development. They were

taken at four stations, the most remarkable being a catch of 8 swordfish and 3 yellowfin tuna on an overnight set of only 60 hooks. The concentrations of swordfish provide new distributional data on this important species and point up the exciting possibility of tracing its migration in more detail by long-line fishing from Cuba northward.

A total of 27 tuna and 22 marlin and sailfish were tagged for the study of migration and population. Bathythermograms, hydrographic stations, transparency measurements, dip-netting, and plankton tows were made in conjunction with all the long-line sets. The stomach contents of the catches were examined to study feeding habits and search for juveniles of the large fish. A wealth of material was gathered for laboratory study and many larvae were hatched and preserved along with matching egg samples.

The gonads of the captured fish were examined to determine their condition relative to spawning. Ovaries of bluefin taken east of the Bahamas contained more eggs than any previously examined and were the largest yet encountered, some pairs weighing up to 25 pounds. A fully ripe female white marlin was caught off Walter Cay, adding to our knowledge of the spawning habits of this species. Measurements of body proportions and fins and counts of fin rays and gill rakers were also made.

The cruise was supported by funds from the National Science Foundation and the U. S. Hydrographic Office. The U. S. Bureau of Commercial Fisheries in Gloucester, Mass., furnished long-line gear. Scientists from the Fish and Wildlife Service and Harvard University, the Bingham Oceanographic Institution at Yale, and the American Museum of Natural History took part in the cruise.

It was the second important long-line cruise for the Crawford, a 125-foot converted Coast Guard cutter. In November 1960 the vessel cruised off the continental shelf along the New England coast and pinpointed the whereabouts of the bluefin tuna at that time of year.

Note: Also see p. 1 of this issue.

* * * * *

TAGGED BLUEFIN SWIMS ACROSS NORTH ATLANTIC OCEAN:

A giant bluefin tuna that swam across the North Atlantic Ocean from the Bahamas to

Norway in less than four months was reported by the Woods Hole Oceanographic Institution on November 1, 1961. The fish was tagged off Cat Cay in the Bahamas on June 10, 1961, according to the scientist in charge of the Institution's tagging program. The tag was recovered near Bergen, Norway, on October 6, 1961.

The distance between the two points is more than 4,500 nautical miles. The time between tagging and recovery was 118 days. That means an average speed of at least 33 miles per day, assuming the fish started the day it was tagged, swam steadily in a beeline for Norway, and was caught the day it got there. The cruising speed of the giant bluefin is thought to be about three knots. This fish may have had some help from the Gulf Stream during part of the trip.

The tag was the first transatlantic recovery from a giant bluefin since the scientist in charge of the Institution's tagging program began the program in 1954. Two much smaller bluefin tagged off Martha's Vineyard, Mass., in July 1954, were recovered by French fishermen in the Bay of Biscay about five years later. In those cases, however, the time lag was too great for any meaningful observations except the fact that they made the ocean crossing.

The scientist noted that the latest recovery was interesting not only because of the short time and long distance involved but because the long migrations of tuna are usually thought to occur in the spring and fall rather than the summer.

The long-distance swimmer was tagged by two sport fishermen participating in the tagging program: the owner, from Wilmington, Del., and the skipper, from Ft. Lauderdale, Fla., of the sportfishing boat *Caliban II*. Between them they have tagged nearly 100 giant tuna. The one they tagged on June 10 weighed about 350 pounds.

The recovery of the tag was reported by a scientist of the Norwegian Institute of Marine Research in Bergen. He said the tag came from a catch of 192 bluefin brought in by a commercial seiner. It was only by a stroke of great luck that the tag was noticed at all, for it was found lying on the dock after the catch had been unloaded. The tag is a bright yellow streamer attached to the fish with a small barb. Each tag is numbered and bears a legend, in several languages, offering a reward for its return.

The Woods Hole Institution's tagging program is aimed at learning more about the migratory habits and growth patterns of the tuna and other large fish such as marlin and sailfish. So far more than 4,500 fish have been tagged, by scientists and cooperative sportsmen: 30 tags have been recovered. The program is supported by the National Science Foundation and the Charles W. Brown Jr. Memorial Foundation.



U. S. Foreign Trade

"E" AWARDS FOR EXPORT EXPANSION:

Secretary of Commerce Luther H. Hodges on December 19, 1961, called on American industry to engage in friendly competition for President Kennedy's new "E" awards for export expansion. The Secretary said he hoped to be able to announce the winner of the first "E" early in 1962, adding that several hundred inquiries were received from companies, financial institutions, and trade associations following the President's announcement of the new program on December 5.

"American industry has a vital role to play," Secretary Hodges said. Through the expansion of exports, it can make substantial contributions to the raising of living standards throughout the world, to the creation of jobs and profits here at home, to the maintenance of a more favorable balance of payment situation which, in turn, will help our country to continue to meet its commitments.

"It is for such contributions as these that the President's 'E' will be awarded. It is our hope that the future of the 'E' symbol in peacetime will be as glorious as was her past in wartime."

Expressing the hope that the first "E" winner could be selected from a field of at least 10,000 nominees, Secretary Hodges outlined ground-rules for administration of the program.

The former Army-Navy "E" for wartime production efficiency has been revived for excellence in export expansion and will be administered by the Commerce Department, in cooperation with a number of other government agencies. Nominations for awards may be submitted by any individual or company to the Commerce Department or any of its 34 field offices.

Nomination forms will be available at all Commerce Department offices, and through the Departments of Interior, Agriculture, and the Small Business Administration.

Completed nominations will be referred to appropriate Commerce field offices, and reviewed by the Department's Regional Export Expansion Committees. These are groups of volunteer international businessmen located throughout the United States.

Local committees will recommend approval or rejection of nominations to an Awards Committee composed of representatives of Commerce, Interior, and Agriculture departments, Small Business Administration, and other government agencies which will be consulted in areas of their specialized competence.

"E" flag awards will be conferred upon companies which: (1) Demonstrate a substantial increase in export sales on a sustained basis; (2) Successfully introduce a new product into the United States export trade; (3) Develop a market abroad for an existing product not previously exported; (4) Effect a breakthrough in a foreign market where competitive conditions are extremely

difficult; (5) Open a new trade area previously closed to American competition.

The "E" Certificate of Service will be awarded to such non-exporting individuals and organizations as banks and trade associations for novel and successful solutions to foreign trade problems, and contributions to the expansion of exports through superior marketing, promotion and other efforts.

Winners of the flag awards will be authorized to fly the blue and white banner over their plants and offices, to display the accompanying certificate of commendation, to issue "E" lapel pins to employees, and to refer to the award in advertising.

"E" certificate winners will also be authorized to issue lapel pins and to mention the award in their advertising.

EDIBLE FISHERY PRODUCTS, NOVEMBER 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during November 1961 rose 7.9 percent in quantity and 6.0 percent in value as compared with October 1961. The increase was due primarily to greater imports of frozen fillets other than groundfish, frozen albacore tuna, canned tuna in brine, fresh and frozen salmon from Canada, and canned sardines in oil and not in oil.

Compared with the same month in 1960, the imports in November 1961 were up 14.9 percent in quantity and up 28.0 percent in value. The increase in value was due to the higher prices for nearly all imported fishery products. The general increase came about because of more imports of all types of frozen fillets, shrimp, oysters, scallops, fresh and frozen salmon, canned tuna, and canned sardines. These increases were offset somewhat by declines in the imports of frozen tuna and canned salmon. The increase in canned sardines was due to the light supplies in the United States because of substantial drops in the packs of Maine and California sardines in 1961.

U. S. Imports and Exports of Edible Fishery Products, November 1961 with Comparisons						
Item	Quantity			Value		
	Nov.	Year		Nov.	Year	
	1961	1960	1960	1961	1960	1960
..(Millions of Lbs.).. ..(Millions of \$)..						
Imports:						
Fish & Shellfish:						
Fresh, frozen & processed ^{1/} ..	100.9	87.8	1,011.2	33.8	26.4	304.8
Exports:						
Fish & Shellfish:						
Processed only ^{1/} (excluding fresh & frozen)	3.9	5.0	48.7	1.9	2.3	19.2

^{1/}Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in November 1961 were up 50.6 percent in quantity and 58.3 percent in value as compared with October 1961. Compared with the same month in 1960, the exports in November 1961 were down 21.9 percent in quantity and 17.4 percent in value. The lower exports in the first 11 months of 1961 as compared with the same period in 1960 were due to substantial declines in the exports of canned shrimp, salmon, California sardines, squid, and frozen salmon. United States supplies of all those products towards the end of 1961 were light. The only significant increases were in the exports of canned mackerel and frozen shrimp to Japan. But frozen shrimp exports tapered off sharply after July because United States landings were down sharply.

EDIBLE FISHERY PRODUCTS, OCTOBER 1961:

Imports of edible fresh, frozen and processed fish and shellfish into the United States during October 1961 rose 12.8 percent in quantity and 21.3 percent in value as compared with September 1961. The increase was due primarily to greater imports of frozen fillets other than groundfish, frozen albacore tuna, canned tuna in brine, fresh and frozen salmon from Canada, canned sardines in oil and not in oil, frozen spiny lobster tails, frozen shrimp, and oysters. The increase in value was greater than the increase in quantity because prices were higher and the increase in imports was in the higher-priced products.

Compared with the same month in 1960, the imports in October 1961 were down 4.0 percent in quantity but up 8.1 percent in value. The increase in value was due to the higher prices in 1961 for nearly all imported fishery products. The drop in quantity came about because of smaller imports of frozen tuna, fresh and frozen salmon, canned salmon, and canned oysters. The substantial declines in the products mentioned were not offset by increases in the imports of frozen groundfish and other fillets, canned tuna, canned sardines in oil and not in oil, canned crab meat, shrimp, and Canadian scallops.

United States exports of processed fish and shellfish in October 1961 were up 100 percent in quantity and 71.4 percent in value as compared with September 1961. Compared with the same month in 1960, the exports in

U. S. Imports of Edible Fishery Products, October 1961 with Comparisons					
Item	Quantity			Value	
	Oct.		Year	Oct.	
	1961	1960	1960	1961	1960
	..(Millions of Lbs.)..			..(Millions of \$)..	
Imports:					
Fish & Shellfish:					
Fresh, frozen & processed ^{1/} . .	93.6	97.4	1,011.2	31.9	29.5
Exports:					
Fish & Shellfish:					
Processed only ^{1/} (excluding fresh & frozen) . . .	2.6	6.1	48.7	1.2	2.8
^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.					

October 1961 were down 57.4 percent in quantity and 57.1 percent in value. The drop in October 1961 exports as compared with the same month in 1960 was due primarily to lower exports of canned salmon, frozen salmon, canned California sardines, and canned shrimp.

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1961 at the 12½-percent rate of duty was 57,114,714 pounds (about 2,720,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota were dutiable at 25 percent ad valorem.

Imports from January 1-December 2, 1961, amounted to 52,024,510 pounds (about 2,477,000 std. cases), according to data compiled by the Bureau of Customs. Imports for the period were up 11.7 percent as compared with the same period in 1960.

Imports in 1960 for the period January 1-December 3 amounted to 46,563,451 pounds (about 2,217,000 std. cases).

Imports from January 1-December 30, 1961, amounted to 56,252,179 pounds (about 2,678,700 std. cases), according to data compiled by the Bureau of Customs. This was only 862,535 pounds (41,300 cases) less than the quota. Imports for the period were up 11.9 percent as compared with the same period in 1960. However, final data for 1961 may be slightly higher.

Final imports in 1960 amounted to 51,159,003 pounds (about 2,436,100 std.

cases)--2,289,327 pounds (about 109,100 std. cases) less than the quota of 53,448,330 pounds (2,545,200 std. cases). In 1959 the quota of 52,372,574 pounds (2,493,900 std. cases) was reached early in December and final imports for that year of 55,304,542 pounds (2,633,500 cases) exceeded the quota by 2,932,000 pounds or 139,600 cases (this amount was imported at the 25-percent ad valorem rate of duty).

Note: Pounds converted to cases at 21 pounds equal 1 std. case of 48 7-oz. cans.

UNITED STATES EXPORTS AND RE-EXPORTS OF FROZEN SHRIMP TO JAPAN, JANUARY-SEPTEMBER 1961:

With the increase in the prices of frozen shrimp and the light supplies, shipments to Japan slowed up considerably in September 1961. Of the almost 7.4 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the first 8 months of 1961, 4.9 million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. A large percentage of the re-exports consisted of shrimp imported into the United States from Mexico.

U. S. Exports and Re-Exports of Fresh and Frozen Shrimp ^{1/} to Japan, January-September 1961				
Type of Product	July	August	Sept.	Jan.-Sept.
 (1,000 Lbs.)			
Domestic	1,211	243	17	1,917
Foreign	1,137	254	40	2,999
Total	2,348	497	57	4,916
^{1/} Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.				

Exports and re-exports of shrimp to Japan from California were negligible prior to 1961. But due to a short supply of shrimp in Japan during the first part of that year and a strong market, that country purchased substantial quantities of shrimp from the United States. Most of the Japanese purchases consisted of frozen raw headless brown shrimp, 21-25 shrimp to the pound. But some shipments included 26-30 count, 16-20 count, and under 15 count.

Note: See *Commercial Fisheries Review*, Jan. 1962 p. 36, Dec. 1961 p. 52, Nov. 1961 p. 35.



Vessel Mortgage Insurance Program

APPLICATIONS RECEIVED AND APPROVED IN 1961:

During calendar year 1961 a total of 9 applications for mortgage insurance were received by the U. S. Department of the Interior under its program for insuring mortgages on fishing vessels. The mortgages covered by the applications totaled \$1,277,500. The program was started in January 1961 when the application of an Alaska salmon canner was approved for insuring a mortgage of \$75,000 on 10 gill-net vessels built to replace fish traps which have been abolished in Alaska.

Of the 9 applications received in 1961, 5 applications for mortgages totaling \$251,500 were approved by the end of the year. One application for a mortgage of \$534,750 was declined. As of the end of the year, 4 mortgage insurance contracts were outstanding covering mortgages amounting to \$229,500. At the end of the year there were 3 applications pending for mortgage insurance on mortgages amounting to \$491,250.

Under the mortgage insurance program the U. S. Department of the Interior guarantees the lender or mortgage holder the insured amount of the mortgage. Should the borrower fail to pay, the Department pays but has legal recourse to the borrower's assets.

Administered by the Bureau of Commercial Fisheries, authorization for the mortgage and loan insurance program was given the Department in March 1958, when the fishing vessel mortgage program was transferred from the Maritime Administration. In July 1960 the Congress approved a method of financing the program should financing be necessary.

Persons obtaining mortgage insurance pay the Department one percent per year on the average unpaid balance of the loan. The money is deposited in a revolving fund which is available to pay claims.

Note: See Commercial Fisheries Review, April 1961 p. 38.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, NOVEMBER 1961:

During November 1961, a total of 19 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 27 in November 1960. The number issued first documents the first 10 months of 1961 was 7 less than in the same period of 1960.

Table 1 - U. S. Fishing Vessels^{1/}--Documentations Issued and Cancelled, by Areas, November 1961 with Comparisons

Area (Home Port)	Nov.		Jan.-Nov.		Total
	1961	1960	1961	1960	
 (Numbers)				
Issued first documents ^{2/} :					
New England	4	2	32	33	35
Middle Atlantic	-	1	11	18	18
Chesapeake	7	8	68	76	78
South Atlantic	1	2	40	46	47
Gulf	6	5	97	85	90
Pacific	1	5	147	141	146
Great Lakes	-	4	12	17	18
Puerto Rico	-	-	2	-	-
Total	19	27	409	416	432
Removed from documentation ^{3/} :					
New England	2	1	18	22	22
Middle Atlantic	7	4	29	15	18
Chesapeake	1	3	27	18	21
South Atlantic	3	5	27	36	38
Gulf	12	8	96	84	90
Pacific	19	15	104	80	87
Great Lakes	1	4	17	12	15
Puerto Rico	-	-	-	1	1
Total	45	40	318	268	290

Note: For footnotes see October 1961 table 2, p. 47.

Note: For footnotes see October 1961 table 2, p. 47.

Table 2 - U. S. Fishing Vessels^{1/}--Documents Issued and Cancelled, by Tonnage Groups, November 1961

Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}
..... (Number)		
5-9	8	9
10-19	6	17
20-29	2	3
30-39	-	3
40-49	-	4
50-59	-	3
60-69	1	1
70-79	2	1
90-99	-	1
100-109	-	1
140-149	-	1
250-259	-	1
Total	19	45

DOCUMENTATIONS ISSUED AND CANCELLED, OCTOBER 1961:

During October 1961, 28 vessels of 5 net tons and over were issued first documents

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, October 1961 With Comparisons

Area (Home Port)	Oct.		Jan.-Oct.		Total
	1961	1960	1961	1960	1960
..... (Number).....					
<u>Issued first documents 2/:</u>					
New England.....	1	4	26	31	35
Middle Atlantic.....	-	2	11	17	18
Chesapeake.....	14	10	61	68	78
South Atlantic.....	2	1	39	44	47
Gulf.....	4	9	91	80	90
Pacific.....	6	7	146	136	146
Great Lakes.....	1	-	12	13	18
Puerto Rico.....	-	-	2	-	-
Total.....	28	33	390	389	432
<u>Removed from documentation 3/:</u>					
New England.....	1	2	16	21	22
Middle Atlantic.....	1	4	22	11	18
Chesapeake.....	-	-	26	15	21
South Atlantic.....	4	5	24	31	38
Gulf.....	7	4	84	76	90
Pacific.....	15	7	85	65	87
Great Lakes.....	-	-	16	8	13
Puerto Rico.....	-	-	-	1	1
Total.....	28	22	273	228	290

1/For footnotes see table 2.

as fishing craft, as compared with 33 in October 1960. The number issued first documents the first 10 months this year was only 1 more than in the same period last year.

Table 2 - U. S. Fishing Vessels 1/--Documents Issued and Cancelled, by Tonnage Groups, October 1961

Gross Tonnage	Issued 2/	Cancelled 3/
..... (Number).....		
5-9.....	12	3
10-19.....	10	14
20-29.....	2	3
30-39.....	1	1
40-49.....	1	-
50-59.....	1	1
60-69.....	1	-
70-79.....	-	1
80-89.....	-	2
160-189.....	-	1
300-309.....	-	1
960-969.....	-	1
Total.....	28	28

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 29 in 1961, 2 in 1960, 1 in 1959, 1 in 1957, and 7 prior to 1951. Assigned to areas on the basis of their home ports.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels to the United States, Bureau of Customs, U. S. Treasury Department.



Water Pollution

CONFERENCE TO EXAMINE PROBLEM OF WATER POLLUTION IN PUGET SOUND, UPPER COLUMBIA RIVER, AND IN MICHIGAN:

The U. S. Department of Health, Education, and Welfare on December 20, 1961, agreed to join with the States of Washington and Michigan in two separate interstate water pollution enforcement actions, applying to United States waters and sources of pollution only.

The waters involved in Washington are Puget Sound, the Strait of Juan de Fuca, and the Upper Columbia River and navigable tributaries within the boundaries of the State. The Michigan waters are the Detroit River and its outflow into Lake Erie.

The two actions are the first to be taken under new provisions of the Federal Water Pollution Control Act, which permit the Secretary to invoke Federal enforcement procedures in intrastate waters when invited to do so by a State Governor. First step in the procedure is a conference, which is then followed where necessary by formal hearings and finally, if still necessary, by action in the Federal courts.

The conference in the Washington State case was to be held in Olympia, Wash., on January 16, 1962. As of mid-December 1961 the Michigan State conference had not been scheduled.

A message was sent by the Department to the Governor of Washington. The message follows:

"I am sending you today official notification that the Department of Health, Education, and Welfare will join the State of Washington on January 16, 1962, in a conference to examine the problem of water pollution in Puget Sound and the Upper Columbia River within the State of Washington and their associated waters. This conference will be the first under the provisions of the Federal Water Pollution Control Amendments of 1961, which permit the Federal Government at the invitation of an individual State to take part in an action involving intrastate pollution.

"You and the State Water Pollution Control Agency have shown great leadership in bringing the State and the Federal Govern-

ments together in this action. Inevitably it will affect the welfare and prosperity of the State of Washington for many years to come and will be a most important factor in preserving the great water resources of the entire Northwest."

A message was also sent by the Department to the Governor of Michigan. The message follows:

"This is in response to your letter of December 6, 1961, requesting action under Section 8 of the Federal Water Pollution Control Act to assist the State of Michigan in correcting sources of pollution coming into the Detroit River and subsequently into Lake Erie.

"We shall be most happy to comply with your request. Our technical staff will be in touch with State representatives to determine with particularity the scope of the problems and investigations required.

"I am sure that a cooperative State-Federal approach will be material value in meeting these water pollution control problems of the State of Michigan."



Wholesale Prices, December 1961

Light supplies of some of the major fishery products were responsible for the increase in wholesale prices from November to December 1961 and from December 1960. Wholesale prices for edible fish and shellfish in December 1961 were up 1.8 percent from the previous month and up 7.8 percent from the same month a year earlier, according to the wholesale price index for edible fishery products (fresh, frozen, canned). There was a steady increase in prices from April through December 1961 except for a slight dip in September.

From November to December 1961, the subgroup index for drawn, dressed, or whole finfish showed the greatest change among the four subgroups included in the index—an increase of 7.1 percent. Light landings of haddock at Boston caused the price of the drawn fresh product to go up 44 percent. Short supplies of yellow pike at New York City raised the prices for that product 33.7 percent. The only

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1961 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			Dec. 1961	Nov. 1961	Dec. 1961	Nov. 1961	Oct. 1961	Dec. 1960
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					143.6	141.1	138.1	133.2
Fresh & Frozen Fishery Products:					158.9	154.6	153.0	150.0
Drawn, Dressed, or Whole Finfish:					163.8	153.0	152.5	173.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.10	141.8	98.5	107.2	178.0
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.36	.35	109.8	108.3	107.3	92.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.86	.85	193.8	191.0	191.0	202.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.63	.83	156.2	204.6	171.1	185.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.84	.48	148.9	111.4	105.5	117.3
Processed, Fresh (Fish & Shellfish):					161.5	158.8	158.6	146.8
Fillers, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.32	.34	107.2	115.7	108.9	175.2
Shrimp, lge. (26-30 count) headless, fresh	New York	lb.	.92	.88	144.6	138.3	136.7	114.5
Oysters, shucked, standards	Norfolk	gal.	7.88	7.88	194.9	194.9	198.0	185.6
Processed, Frozen (Fish & Shellfish):					133.7	133.9	130.5	115.0
Fillet: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	100.8	100.8	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.35	103.6	109.9	103.6	106.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.30	124.9	120.8	120.8	118.8
Shrimp, lge. (26-30 count), brown, 5-lb. pk.	Chicago	lb.	.92	.90	141.2	138.1	135.8	106.5
Canned Fishery Products:					121.9	121.8	117.1	109.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	143.5
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	87.6	87.6	84.0	79.3
Sardines, Calif., tom, pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.00	4.90	116.7	114.4	114.4	89.8
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	12.31	12.31	131.0	131.0	109.7	90.5

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



offsetting decrease occurred in fresh whitefish prices at Chicago which dropped 23.7 percent. Prices for frozen Western halibut at New York City rose 1.4 percent and for frozen king salmon at New York City rose 1.5 percent, in both instances because of good demand. On the other hand prices for this subgroup in December 1961 were down 5.6 percent from the same month in 1960. There were substantial price declines for fresh large haddock at Boston (down 20.3 percent), fresh whitefish at Chicago (down 16.0 percent), and frozen king salmon at New York City (down 4.2 percent). These declines were not quite offset by price increases of 18.3 percent for frozen Western halibut at New York City and 26.9 percent for frozen yellow pike at New York City.

Among the fresh processed products, prices rose 1.7 percent from November to December. Shrimp prices

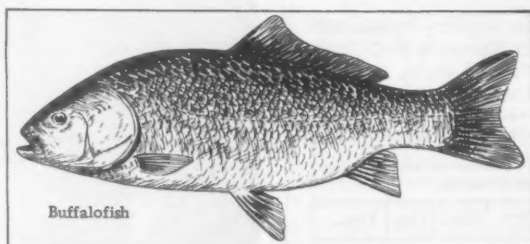
were up 4.6 percent with supplies still below demand. Fresh shucked oyster prices remained steady. But fresh haddock fillet prices dropped 7.4 percent. From December 1960 to December 1961, the prices for fresh processed fish and shellfish were up 10 percent principally because shrimp prices rose 26.3 percent and shucked oyster prices rose 5.0 percent. A drop of 38.8 percent in fresh haddock fillet prices at Boston prevented the subgroup index from showing a more substantial gain.

As a subgroup, there was practically no change in the index for frozen processed fish and shellfish from November to December 1961. But among the individual products, there were significant changes. While prices of frozen shrimp at Chicago and for frozen ocean perch fillets at Boston rose because of lighter supplies, heavier stocks of frozen haddock fillets caused a price drop for that product of 5.7 percent. However, prices for the subgroup in December 1961 were up 16.3 percent for a year earlier principally because of a 32.6 percent rise in the prices of frozen shrimp at Chicago and to a lesser extent because of an increase of 5.1 percent in frozen ocean perch fillet prices at Boston. Offsetting these increases were slightly lower prices for frozen flounder fillets and haddock fillets at Boston because of more plentiful supplies.

Among the canned fishery products, there was very little change from November to December 1961. There was a very small increase of 2.0 percent in canned California sardine prices because the pack through December was substantially less than in 1960. But canned fishery products prices from December 1960 to December 1961 were up 11 percent because of smaller packs of California sardines and Maine sardines. On the other hand, although the packs of canned tuna and canned salmon in 1961 were greater than in 1960, the demand for those products has more than kept pace with the increased supplies. Canned fish prices were up for all items included--canned pink salmon (up 1.8 percent), canned tuna (up 10.5 percent), California sardines (up 30.0 percent), and Maine sardines (up 44.8 percent).



FISH BIOGRAPHIES



Buffalofish

OTHER NAMES INCLUDE: Winter carp.

CHARACTERISTICS: Lean, firm and flaky, rich flavor.

MARKET SIZE: About 5 to 15 pounds.

MARKET FORM: Whole, drawn, dressed, steaked, filleted, and smoked.



International

INTERNATIONAL NORTHWEST PACIFIC FISHERIES COMMISSION

SIXTH ANNUAL MEETING:

The Sixth Annual Meeting of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.) convened in Moscow on February 26, 1962, to adopt regulations and set a salmon catch quota for Japan for the 1962 fishing season.

The Science and Technology Committee of the Commission met in Moscow prior to the main meeting. The purpose of holding the preliminary talks is to shorten the period of negotiations by the Commission. Four main topics were discussed: (1) methods used in estimating the condition of the salmon resources; (2) expected salmon runs in 1962; (3) exchange of scientists and experts for joint surveys in 1962; and (4) success of the joint surveys in 1961.

RUSSIAN AND JAPANESE PACIFIC SALMON CATCH, 1961:

The Japanese Fisheries Agency released on December 19, 1961, the Russian and Japanese 1961 Pacific salmon catch data, which were exchanged between the two countries at

Table 1 - Russian Catch of Pacific Salmon by Area and by Species, 1961

Area	Species of Salmon					
	Red	Chum	Pink	Silver	King	Total
(Centners 1/.).....					
East Kamchatka ..	10,203	49,976	136,580	23,494	5,842	220,094
West Kamchatka ..	57,731	29,431	44,322	21,078	699	163,261
Sakhalin-Kurils ..	-	14,452	71,840	-	-	86,292
Islands	-	19,847	34,514	301	-	54,662
Northern Okhotsk ..	405	130,539	7,184	323	-	138,451
Okhotsk Region ..	-	126,281	2,274	-	-	128,555
Amur	-	-	6,061	-	-	6,061
Maritime Province ..	-	-	-	-	-	-
Total	78,339	364,525	302,775	45,196	6,541	797,376
1/One centner equals 100 kilograms or about 220 pounds.						

the meeting of the Science and Technology Committee of the International Northwest Pacific Fisheries Commission now in progress in Moscow. The Soviet catch totaled 79,738 metric tons and the Japanese catch, 145,664 tons.



Pulling in a gill net aboard a Japanese vessel in the North Pacific and removing the salmon from the net.

Press reports concerning the progress of the Technical Committee meeting indicate that Japan and the Soviet Union have reached agreement over the method of evaluating resources but have not been able to agree on the

International (Contd.):

Table 2 - Japanese Catch of Pacific Salmon by Fishery and by Species, 1961

Fishery	Species of Salmon					
	Red	Chum	Pink	Silver	King	Total
 (Metric Tons.).....					
Mothership ...	34,901	13,013	4,908	647	105	53,574
Gillnet 1/....	1,798	13,118	49,316	3,632	362	3/68,226
Longline 2/...	39	2,723	11,155	7	39	13,963
Coastal trap ..	-	257	9,644	-	-	4/9,901
Total	36,738	29,111	75,023	4,286	506	145,664
1/Land-based fishery conducted south of 48° N. latitude and east of Kurile Islands and Eastern Hokkaido. That part of this fishery between 48° N. and 45° N. governed by Russian-Japanese Fisheries Treaty.						
2/Land-based fishery conducted south of 45° N. latitude off Eastern Hokkaido. This fishery wholly outside of Russian-Japanese Fisheries Treaty waters.						
3/Figures include 11,355 metric tons of salmon taken in Russian-Japanese Fisheries Treaty waters (between 48° and 45° N. latitude).						
4/Figures include catch for period of January-July 1961.						

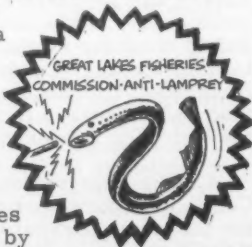
interpretation of data. The Soviet Union claims that the Japanese high-seas fishing has caused an unprecedented decline in the abundance of salmon stocks, a claim strongly refuted by Japan. Japan is taking the position that it is undeniable that the abundance of pink salmon, for example, has declined in recent years, but it is not altogether possible to say on the basis of available data that the 1961 pink salmon run was any worse than the parent run in 1959, and asserts that natural mortality must also be taken into account in evaluating the status of the salmon resources. (Nippon Suisan Shimibun, December 20; Suisan Tsushin, December 19, 1961.)

Note: See Commercial Fisheries Review, April 1961 p. 46.

INTERNATIONAL GREAT LAKES FISHERIES COMMISSION

INTERIM MEETING OF COMMISSION:

An interim meeting of the International Great Lakes Fishery Commission was held in London, Ontario, November 29-30, 1961. Reports on the progress of the sea lamprey control program were made and they presented a much more optimistic picture than in previous reports. Evidence based upon recent scarring of Great Lakes trout and lake herring by lamprey indicates that the lamprey population has been reduced substantially. The true de-



cline in lamprey abundance cannot be accurately predicted on the basis of these preliminary data and will not be available until July 1962. Nevertheless, these preliminary data are very encouraging and, on the basis of these findings, the Commission recommended to the States the elimination of all fishing for lake trout, except that necessary for proper biological sampling of the lake trout populations. Thus, for the first time the Commission has publicly recognized evidence of lamprey control and is recommending regulations which will enhance the trout rehabilitation program.

The second objective of the Convention, which is to recommend to the States long-range programs to achieve coordinated conservation and utilization of the fisheries resources of the Great Lakes, is also being studied by the Commission. Eastern States bordering Lakes Erie and Ontario have felt that a disproportionate share of the attention of the Commission has been placed on sea lamprey control. The action which emphasizes the establishment of scientific committees on each lake to study long-range programs has brought much favorable comment from advisers of the Eastern States.

In general, the meeting was perhaps the most significant held yet by the Commission and the results reported were the most encouraging.

FOOD AND AGRICULTURE ORGANIZATION

ELEVENTH SESSION OF CONFERENCE:

The Food and Agriculture Organization of the United Nations held its Eleventh Conference in Rome, Italy, from October 20 to November 23. This Conference is held once every two years to enable member countries of FAO to review past programs, determine the program of work and the budget for the coming two years, and to consider long-range programs. Programs were discussed fully in technical committees, one each for Fisheries, Agriculture, Forestry, Nutrition, Economics, and Information and Publications.

Representatives from 43 countries attended the meetings of the Technical Committee on Fisheries to consider the program of work for FAO's Fisheries Division. U. Khin (Burma) was elected Chairman, Thomas S. Leach



International (Contd.):

(United Kingdom) and Joran Hult (Sweden), Vice-Chairman, and Sidney Shapiro (United States), Rapporteur. Representatives from the developing countries made strong statements requesting FAO assistance in developing the fisheries of their countries.

The report of the Technical Committee on Fisheries was approved by the FAO Conference with only several minor changes. A summary of the highlights of the report follows:

Attention was drawn to the doubling of the world's annual fishery production during the past dozen years to 38 million tons, a possible further increase to as high as 70 million tons by the end of the next decade or two, and the problems that would arise in utilizing this expanded production effectively. FAO's Fisheries Division was commended for its past and present programs and for the good balance in programs that was proposed for the coming two years.

The Fisheries Committee discussed the relationship between the Fisheries Division's regular program and aid programs, such as the Freedom-from-Hunger Campaign, Expanded Program of Technical Assistance, U. N. Special Fund, and *ad hoc* aid to member countries. The Fisheries Division was asked to evaluate the effect of such programs on the regular program, and to make recommendations for future appropriate consideration. Annual reviews of the status of the aid programs would also be prepared by the Division, and should prove useful in making recommendations for coordinating aid programs with the regular program, and also with those conducted by the United States and other governments.

The Fisheries Committee dealt with a number of specific programs of direct concern to United States Government fishery agencies and the fishing industry. Among the most important items were:

1. The Fisheries Committee recommended the establishment of an Advisory Committee on Marine Resources Research (which will consist of not more than 15 members) and also a Panel of Experts to deal with other subjects besides marine resources research, for example technological and economic matters. This arrangement will en-

able the Fisheries Division to obtain the advice of world-renowned experts on a continuing rather than on an *ad hoc* basis in all fields of fishery development. As finally worded, the Conference authorized and requested the Director-General under Article VI, paragraph 2, of the FAO Constitution to establish this Advisory Committee. The Conference also stipulated that members of the Advisory Committee and the Panel of Experts should be drawn from governmental and nongovernmental bodies of FAO Member Countries.

2. The Fisheries Committee developed working relations between FAO and UNESCO's Intergovernmental Oceanographic Commission in the field of oceanography. In accord with a resolution adopted at the first meeting in Paris (October 19-27) of the Intergovernmental Oceanographic Commission (IOC) on relationships between that organization and other organizations, the United States Delegation at the meetings of the Technical Committee on Fisheries urged FAO's Fisheries Division to cooperate fully in IOC programs so that the fisheries aspects of oceanography could be properly integrated with physical, chemical, and other aspects. The Technical Committee adopted this proposal, and also suggested that the Advisory Committee on Marine Resources Research could well be useful in advising IOC in this respect. *Ad hoc* cooperation between IOC and FAO has already been established and is to be continued. The Technical Committee on Fisheries also recommended that the Director-General of FAO should invite working parties and expert panels of IOC to use the facilities of the Fisheries Division.

3. The Technical Committee noted the useful recommendations of the International Conference on Fish in Nutrition, and urged the Director-General of FAO to implement these recommendations, if possible. The Advisory Committee on Marine Resources Research will be asked to evaluate the potential productivity of the world's aquatic resources and to consider methods of using this production efficiently. Education and training of fishermen, fish handlers, and processors had also been stressed in the recommendations of the Nutrition Conference.

4. The Thirty-Sixth Session of the FAO Council had already given strong approval for the Director-General of FAO to initiate action programs by fishery technologists and economists, in collaboration with the Nutri-

International (Contd.):

tion Division, for the testing and promotion of fish protein concentrates for human consumption. The proposed programs are to include palatability and acceptability tests, controlled clinical and mass-feeding tests, and public education and promotion campaigns. Technical details concerning implementation of such programs were referred to the Technical Committee on Fisheries. The programs will be conducted under the Freedom-from-Hunger Campaign, and the active participation of industry and of WHO, UNICEF, and other organizations in the United Nations family will be sought. Fishery advisers on the United States Delegation held a series of meetings with the staff of the Fisheries Division on such matters as contributions from industry, the types of fish protein concentrates that will be used, and other technical and operational procedures. Action programs are soon to be initiated in Chile and Peru.

5. Two items on the agenda of the FAO Conference were concerned with the establishment of FAO regional fisheries commissions--one for West African countries and one for the countries bordering the South-West Atlantic. U. S. interest in these commissions stems from extensive aid programs to countries in those regions and from specific interest of the United States fishing industry in the developing fisheries of Africa and Latin America.

A resolution was adopted which now establishes a new FAO Regional Fisheries Commission for Western Africa. The resolution provides observer status for member countries of FAO that are not regional members of the Commission. The terms of reference for the establishment and operation of the Commission follow closely the recommendations of a meeting convened by the Director-General of FAO at Dakar, Senegal, in May 1961.

The FAO Conference considered a draft resolution which would establish a regional commission to be known as the "South West Atlantic Fisheries Advisory Commission." Brazil, Uruguay, and Argentina supported the resolution, as drafted. The United States spoke in favor of establishing a fisheries commission for the South American countries, provided that a majority of the countries in the region supported such a commis-

sion. However, in view of the difficulties that may arise with regards to the terms of reference, membership, geographical extent, and other matters, the United States suggested that the Conference agree in principle with the draft resolution, and authorize the Director-General to establish the Commission on the basis of statutes drawn up in consultation with the FAO Committee on Constitutional and Legal Matters. The United States proposal was adopted.

6. The Fisheries Committee commented favorably on previous worldwide meetings convened by FAO. Preparations for holding an FAO World Meeting on the Biology of the Tunas and Related Species are already under way; the United States will host this meeting at the Scripps Institution of Oceanography, La Jolla, Calif., in July 1962. Because the workload in preparing and conducting such meetings and in publishing the final results is considerable, it was suggested that, in the future, meetings be scheduled only as necessary to meet the need for inquiry into new advances in scientific and technical development. It was also suggested that regional meetings be held in preparation for worldwide meetings. The Committee subscribed to the holding of future biological meetings, for example on hake and shrimp, and to a symposium on fresh-water fish culture in 1964, all subject to the availability of funds. Other international meetings urged by the Fisheries Committee were a symposium on the role of fundamental research in the successful utilization of fishery products (a recommendation of the International Conference on Fish in Nutrition), an International Fishing Gear Congress in 1963, and a world meeting on fishery administration in the 1964-65 biennium. The possibility of holding a world symposium on fisheries oceanography in 1964 or 1965 will be explored.

Membership in the Food and Agriculture Organization has now increased to 104; 16 of these are new members mainly from Africa. FAO has grown in stature, and its prestige among developed and developing countries has increased even during the past few years. The budget appropriation for 1962 and 1963 is about 30 percent more than was voted for the previous two years--1960-61. The Fisheries Division's program of work is expanding and can be expected to expand at an even greater rate as world fishery production increases.

International (Contd.):

Fisheries are a primary renewable resource and developing countries are turning to those resources as one of the first items in their national development programs. Logically these countries are looking to FAO for advice and guidance in biological, oceanographic, technological, and economic matters relating to fishery development. FAO's fisheries work is not confined to the developing countries. In the developed countries, new techniques and increased production are constantly creating crises in the distribution and marketing of certain abundantly-produced fishery products. FAO has in the past (e.g., the International Conference on Fish Meal held in March 1961) offered services to assist in improving the distribution and marketing of fishery products. More demands for this and other types of services can be expected in the future.

Note: See Commercial Fisheries Review, January 1962 p. 43.

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MARINE RESOURCES ADVISORY COMMITTEE APPROVED BY FAO COMMISSION:

An Advisory Committee on Marine Resources Research to aid FAO's Fisheries Division in assessing fish stocks and in oceanographic research has been approved by Commission Two, meeting in Rome in conjunction with FAO's 11th Conference.

Commission Two, which considered the Fisheries Division's entire program of work for 1962/63, also approved a fisheries advisory commission for the southwest Atlantic. This commission would function similarly to other FAO regional councils.

In describing the work of the proposed Advisory Committee on Marine Resources Research, the Director of the Fisheries Division told the delegates that the committee's first function would be to advise on the best way to use money and manpower available to further fisheries research in the marine fisheries field.

"Mainly, the commission would help the Fisheries Division's Biology Branch in preparing its program to aid both intergovernmental and international organizations in marine resources research," said the Director.

"We have already been cooperating with these organizations, but the magnitude of this work and the almost explosive growth in oce-

anographic research has made this committee necessary."

As approved by Commission Two, the advisory committee would be composed of about 10 leading fisheries scientists from countries which are either members of FAO or the U. N. At first, it would meet once a year.

Commission Actions: In other actions, the Commission urged the holding of a symposium on fresh-water fish culture in 1964, and that the possibility of holding a world symposium on fisheries oceanography sometime in 1964/65 be explored. It also approved holding a World Scientific Meeting on the Biology of Tuna in 1962, an International Fishing Gear Congress in 1963, and a world meeting on fishery administration during 1964-65. Further work on promoting the human consumption of fish protein concentrates was also approved.

The Commission recommended that more attention be given to providing bibliographic and other reference materials--for example, handbooks, lists of wholesale markets--in the field of fisheries economics where such a service is almost non-existent.

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

FIRST SESSION HELD IN PARIS:

The first session of the Intergovernmental Oceanographic Commission (IOC) was held in Paris, October 19-27, 1961. The session was attended by representatives from 40 member governments, 4 observer governments, 6 specialized agencies of the United Nations, 10 intergovernmental organizations and nongovernmental organizations, and the UNESCO Secretariat.

The session helped clarify the special relationship of the Commission to UNESCO as prescribed in the statutes of the Commission. The Acting Director General of UNESCO stated his view that although the Commission was established by resolution of the General Conference of UNESCO to function within the framework of UNESCO, the Commission should in fact accomplish the scientific and technical aspects of its work as though it were outside UNESCO. UNESCO, on its part, would supply the necessary housekeeping and secretarial services to the Commission as well as give it general policy guidance. This unique relationship was reflected in the

International (Contd.):

Rules of Procedure adopted by the Commission.

No definite decision was taken by the Commission to establish advisory bodies on oceanography. In a unanimously approved resolution, the Commission invited the United Nations and its specialized agencies to cooperate with the Commission; expressed the hope that interested specialized agencies such as the Food and Agriculture Organization (FAO) and the World Meteorological Organization (WMO) would designate members of their secretariats to cooperate actively with the Secretariat of the Commission, in a manner to be decided by agreement between those agencies and UNESCO; requested the Members to submit to the Secretariat, for consideration at the second session of the Commission, their views on the advisory channels to be established; and allowed the Bureau and the Secretariat of the Commission, during the interim period, to seek and receive advice on oceanography from all sources. The United States Delegation was successful in obtaining general acceptance by the Commission of the particularly significant role which FAO could play in oceanography and more specifically in the field of fishery, oceanography, and the special competence of the Special Committee on Oceanic Research (SCOR) of the International Council of Scientific Unions (ICSU) in the other aspects of oceanography.

The Commission took the first steps to coordinate national and regional programs in oceanography and to establish the organizational mechanism, within the Commission, which could develop an integrated, well-coordinated international program in oceanography. In this connection, the Commission unanimously adopted 9 resolutions.

Also unanimously adopted were a resolution on the better utilization by member governments of oceanographers and a resolution recommending that less developed countries interested in oceanography submit requests for assistance in oceanography to the United Nations Special Fund and Expanded Program of Technical Assistance and requesting the Director General of UNESCO to consider the possibility of increasing or modifying the UNESCO program on oceanography to give more assistance to the developing countries in that field.

The work of the session was expedited by the establishment of three working groups on (1) Fisheries Aspects of Oceanography and relationships between IOC and other International Organizations; (2) Cooperative International Programs of Oceanic Investigations; and (3) Coordination of National Programs and Consideration of Technical Questions.

The Commission also established a consultative committee to advise and assist the Bureau during the period prior to the second session of the Commission.

The principality of Monaco invited the Commission, through the Director General of UNESCO, to hold its second session at Monte Carlo. The Commission, however, decided to hold its next session in Paris sometime in the autumn of 1962. (United States Embassy, Paris, November 24, 1961.)

Note: Also see *Commercial Fisheries Review*, January 1962 p. 44.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FISHERIES COMMITTEE MEETS:

The Fisheries Committee of the Organization for Economic Cooperation and Development met at Paris, France, December 13-14, 1961, to consider the 1962 program of work and a study of subsidies and other financial supports to the fishing industries.

GENERAL AGREEMENT ON TARIFFS AND TRADE

REPORT ON NINETEENTH SESSION:

New procedures for future tariff reductions, special measures to achieve broader access to world markets for agricultural products, and intensified efforts to expand the export earnings of less-developed countries were the central topics considered by the Contracting Parties to the General Agreement on Tariffs and Trade (GATT) at their Nineteenth Session which ended in Geneva on December 9, 1961. Each of these matters has been the object of intensive study by the Contracting Parties under their Program for the Expansion of Trade. They were further considered at the GATT Ministerial Meeting on November 27-30, and in accordance with decisions adopted by the ministers, the Contracting Parties approved action programs for intensified efforts to expand world trade.

Meeting from November 13 to December 9, contracting parties and governments associated with the GATT called a recess in their regular session so that trade ministers might

International (Contd.):

meet to provide the necessary additional policy guidance for further steps to carry forward the GATT's trade expansion program.

In addition to work related to the Ministerial Meeting, the Contracting Parties at their Nineteenth Session dealt with an extensive agenda of some 60 topics including such matters as regional economic arrangements, quantitative import restrictions, the application of GATT trading rules to Japan by all contracting parties, and the welcoming of a new nation--Tanganyika--as the Fortieth Contracting Party to the GATT.

Perhaps the most far-reaching actions taken by the Contracting Parties, however, were those directed to Ministerial conclusions on the trade problems identified in the work of the Program for the Expansion of Trade and the new tasks arising from these conclusions.

The ministers reaffirmed their confidence in the General Agreement as the basis for the trading relationships of their countries and agreed that steps should be taken to increase its effective application in the three fields of action (tariff reduction, trade in agriculture, and trade with the less developed countries) which were submitted to the ministers for their consideration. The ministers adopted four conclusions, together with recommendations for additional action by the Contracting Parties:

(1) The multilateral reduction of tariffs on a most-favored-nation basis should be continued, but new techniques should be adopted, suited to the changes that had taken place in world trading relationships. In this connection one of the techniques most prominently mentioned by ministers was some form of across-the-board or linear tariff negotiation. Accordingly, the Contracting Parties established a working party on procedures for tariff reduction, which will meet in the near future to examine new procedures and techniques for the further reduction of tariffs on a most-favored-nation basis.

(2) Having expressed great concern over the degree and extent of agricultural protectionism, the ministers requested that the Contracting Parties adopt procedures designed to form the basis for the negotiation of "practical measures for the creation of

acceptable conditions of access to world markets for agricultural commodities."

(3) The ministers' discussion of obstacles to the trade of less-developed countries reflected widespread concern that the present rate of growth of the export earnings of the less-developed countries is not keeping pace with the growth of their foreign exchange requirements and recognition that aid can be no substitute for trade in the financing of economic development. Accordingly, the ministers adopted a United States-sponsored declaration on promotion of the trade of less-developed countries. The declaration recognizes the need for a special effort by all governments to expand the export earnings of the less-developed countries, particularly through providing improved access to markets, and sets forth certain guiding principles to this end. The ministers further agreed that their governments should observe these principles as fully as possible, with the aim of reducing obstacles to the trade of the less-developed countries in the near future. Moreover, in response to an appeal from the less-developed countries for some concrete measures of assurance that early progress will be made, the ministers asked the Contracting Parties to draw up specific programs of action for the reduction of trade barriers and to establish procedures for keeping under review the actions taken by individual governments to improve market opportunities for the less-developed countries.

Besides adopting the declaration on the promotion of trade of less-developed countries, the Contracting Parties agreed that preliminary arrangements for future action programs envisaged by the ministers would be undertaken at a meeting of the GATT's Committee III prior to February 1962. The Contracting Parties also accepted the conclusion of most of the ministers that the question of duty-free entry for tropical products should be given careful consideration.

Finally, the ministers considered the situation resulting from the fact that the GATT was not being applied to trade relations between Japan and some of the contracting parties. Some ministers expressed the hope that early action could be taken by the contracting parties concerned to enable Japan to participate fully in the GATT, and agreed that such action would greatly add to the effectiveness of the GATT. The United States strongly supported this conclusion.

International (Contd.):

Other noteworthy trade policy matters before the Contracting Parties were regional trading arrangements, including the European Economic Community (EEC), the European Free Trade Association (EFTA), and the Latin American Free Trade Area (LAFTA): programs designed to eliminate or significantly reduce quantitative import restrictions still imposed by some contracting parties; and a new free trade area established between Sarawak and North Borneo. Decisions were also taken agreeing to the accession to the GATT of Israel and Portugal upon the completion of certain formalities relating to tariff negotiations both countries completed during the 1960/61 GATT tariff conference.

EUROPEAN FREE TRADE ASSOCIATION

COUNCIL ACCELERATES
10 PERCENT TARIFF CUT:

The European Free Trade Association (EFTA) Council of Ministers met in Geneva, November 20-21, 1961, and decided to cut tariffs among EFTA members by a further 10 percent in 1962, in order to keep pace with similar tariff cuts in the Common Market. This marked a steep acceleration in tariff cutting since, under the Stockholm Convention (EFTA's "constitution"), the next tariff cut was not due until July 1, 1963.

The first EFTA tariff cut, one of 20 percent, was made on July 1, 1960, less than two months after EFTA came into being. The next cut, one of 10 percent, was scheduled for January 1, 1962, but was actually put into effect on July 1, 1961.

The new 10 percent cut--bringing the total to 40 percent--will be implemented by Denmark, Portugal, Sweden, Switzerland, and the United Kingdom on March 1, 1962, and by Austria and Norway not later than September 1. (EFTA Reporter, November 29, 1961.)

Note: See *Commercial Fisheries Review*, August 1961 p. 50.



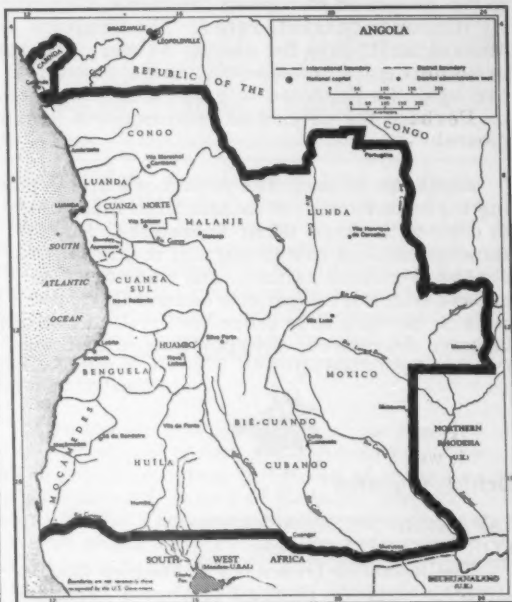
Angola

GOVERNMENT PLANS FOR
FISHERIES DEVELOPMENT:

As a part of an over-all plan for improving the economic status of the country, the

Government of Angola has outlined a fishery development plan.

In ocean fishing it plans to (1) intensify and orient studies of ocean biology, especially those regarded as economically useful; (2) introduce new methods (e.g. trawling) to permit the catch of more valuable species and in more abundant quantities; (3) improve present fishing methods; and (4) improve and equip processing plants for more efficient utilization of the fish catch.



In inland waters, the Government plans to (1) increase fish production; and (2) intensify fish culture in ponds as a means of supplementing the diet of people in the interior. (United States Consulate, Luanda, October 24, 1961.)



Benelux Countries

CANNED FISH IMPORT TARIFFS
TO BE RAISED:

The Benelux countries (Belgium, the Netherlands, and Luxembourg) are reported to have informally approved higher tariff rates on imports of canned food effective January 1, 1962, according to information released by the Belgian Embassy in Tokyo, Japan. The

Benelux Countries (Contd.):

new tariff schedule as it affects certain canned fishery products is:

Product	Present Tariff Rate ... (Percent ad valorem) ...	New Tariff Rate
Canned salmon	0	6
Canned sardine	20	21.5
Canned herring	20	23

The Benelux countries raised their national tariff rates to bring them a step closer to the proposed European Economic Community (Common Market) rates. The Common Market tariff rate for canned salmon imports is 20 percent; consequently, these countries can again be expected to raise their national tariff rates for canned salmon imports in the future.

Japanese canned fish producers are pressing their Government to establish measures to cope with these tariff increases, for the Benelux nations are important markets for Japanese canned salmon, and this tariff increase will hurt Japanese canned fish producers, particularly since the British market is quite depressed. (*Nippon Suisan Shimbun*, December 6, 1961.)



British Guiana

JAPANESE FISHERY EXPERT
FOR BRITISH GUIANA:

The Japanese Overseas Fisheries Cooperative Association planned to send a Japanese fishery expert, employed by a large Japanese fishing company, to British Guiana in December 1961. The expert, to be sent in response to a British Guiana request, will be employed by a British Guiana company under a two-year contract and will serve as master of a trawler newly added to that company's fishing fleet. He is the second Japanese fishery expert to be sent to British Guiana. (*Shin Suisan Shimbun Sokuho*, November 25, 1961.)



Canada

ANNUAL MEETING OF FISHERIES
RESEARCH BOARD OF CANADA:

Increased efficiency in fishing methods, improvements in fish handling, and efforts to overcome water pollution were commended by the Canadian Fisheries Minister as among the more valuable contributions of the Fisheries Research Board of Canada. The Minister spoke on January 4, 1962, at the opening of the annual meeting of the Board in Ottawa, Canada. The meeting ended on January 8.

Studies toward making the best and fullest possible use of the fish catch are most important, he said, as the gap between available food and the needs of the growing number of people continues to widen. "The Board's scientists have in my view contributed very substantially already in improving methods of fish handling, preservation and processing, and in developing byproducts as well," he said. "The proposed studies leading toward increasing our fishing efficiency in international waters so that Canadian fishermen can continue to reap their fair share of the international catch in the face of growing competition are, in my view, also very important. That a concerted effort toward achieving this is being planned by the Board, the Department of Fisheries, and other government agencies is highly commendable."

The Minister referred to the dangers of water pollution, saying that progressive industrialization and urbanization of a country was often paralleled by threatening pollution of its waters. "Our particular responsibility is on the effects of pollution on aquatic life, and our job is one of prevention rather than correction where this can be done. But as new chemicals and new pollutants are being added to our waters daily we must at least be able to recognize and neutralize, if we can't avert. This is not an easy task, but it is one where we cannot sidestep responsibility."

The Board is made up of 16 members in addition to the full-time chairman. The members appointed by the Minister of Fisheries for five-year terms and serve without pay. They are chosen from Canada's leading scientists, the fishing industry, and the Federal Department of Fisheries.

Canada (Contd.):

BRITISH COLUMBIA SALMON PACK, 1961:

Salmon, British Columbia's principal dollar earner, experienced the second best year since 1958 when 1,900,025 cases were packed. The 1961 pack was up 122 percent from that for 1960 and was 30.3 percent more than

have been brought about by the development of refrigerated sea-water transportation and storage of fish, a January 4, 1962, news release from the Canadian Department of Fisheries pointed out.

One refrigerated sea-water salmon packer (transport vessel), with a capacity of 450,000

British Columbia Canned Salmon Pack, 1956-61

	1961	1960	1959	1958	1957	1956
	(Standard Cases—48 1-Lb. Cans)					
Sockeye (red)	398,303	226,905	256,170	1,074,305	228,452	320,096
Spring (king)	7,488	5,913	15,230	10,550	10,481	11,671
Steelhead	979	500	867	1,205	1,126	1,254
Blueback	12,521	23,456	10,114	11,103	12,147	10,549
Coho (silver)	228,213	68,891	202,991	120,424	180,911	207,366
Pink	661,103	219,624	458,597	451,802	751,608	363,633
Chum (keta)	95,387	86,800	133,128	230,636	239,539	203,710
Total	1/1,403,994	1/632,089	1/1,077,097	1,900,025	1,424,264	1,118,279

1/Includes fish canned from previous year's frozen fish.

that for 1959. The 1961 pack was almost 74 percent of the pack reported in 1958. The leading species packed was pink salmon, followed by red or sockeye, coho or silver, and chum or keta.

Note: See Commercial Fisheries Review, January 1961 p. 57.

DEVELOPMENT OF ACTIVE TUNA FISHERY IN PACIFIC:

The development of an active tuna fishery in the Pacific based in British Columbia maybe brought closer to reality by work now being carried out by the Fisheries Research Board of Canada at its technological station in Vancouver.

This work, described at the Board's annual meeting in Ottawa, involves the design of freezing equipment which can be used at sea to preserve the catch and enable vessels to range far offshore. The Board's technologists are working with the Industrial Development Service of the Federal Department of Fisheries on the project, which in its present state is intended to equip four big seiners with suitable freezing systems which will differ in certain important respects from those now in use on United States tuna vessels. The equipment being designed is felt to have many advantages for local vessels.

REFRIGERATED SEA WATER USED TO TRANSPORT AND STORE SALMON:

Revolutionary changes in the handling of salmon in certain areas of British Columbia

pounds of fish, completed in 1961, is giving thoroughly satisfactory performance. Other packers already in use are being converted to employ the same engineering principles, which were developed by the Fisheries Research Board of Canada at its technological station in Vancouver. Similar application of refrigeration techniques have been or are being made to halibut fishing vessels and salmon trollers.

This industrial application of the results of technological investigations was reported at the annual meeting in Ottawa of the Fisheries Research Board of Canada. Experiments at the Vancouver station over the past several years have resulted in principles which include the means of driving equipment for the vessels, the design of heat exchange units, and construction of tanks and piping with a view to ease of sanitation.

ANTIBIOTICS USED TO PRESERVE FISH FILLETS:

An example of the adoption by the Canadian fishing industry of the developments of research at the Vancouver, B. C., technological station is the use of antibiotics as preservatives for food fish. This method is now being used extensively for fillets in the Maritime provinces of Canada, according to a January 4, 1962, news release of the Canadian Department of Fisheries.

Canada (Contd.):

VACUUM METHOD OF CANNING HERRING DEVELOPED:

A method of canning herring developed by the Technological Station of the Fisheries Research Board of Canada in Vancouver, B. C., has been brought into commercial use by a British Columbia cannery. The method, involving a stage in processing where the herring is placed under vacuum, produces a firmer, more palatable product than older methods. It was described at the Board's annual meeting in Ottawa.

The vacuum is drawn immediately after precooking, when the herring are in open, inverted cans in the steam retort. Vacuum is maintained for several minutes after which sauces are added, the cans sealed, and the cooking process completed.

Among the advantages of the vacuum method is a rapid cooling effect which firms up the fish. Relatively simple adjustments and equipment are necessary to convert the steam retorts to the vacuum process.

NEW METHOD OF UNLOADING SALMON FROM VESSEL TO REDUCE HANDLING:

A new method of unloading salmon that can substantially reduce or eliminate fish handling from the vessel to the plant is the subject of an engineering project at the Technological Station of the Fisheries Research Board of Canada in Vancouver, B.C.

The idea of such a method, involving the use of pressurized containers aboard vessels, was initiated by a British Columbia fishing company. Engineers at the Technological Station designed and tested a working model, based upon the original suggestion but involving important changes in design. The project was described at the annual meeting of the Board.

The model worked effectively with herring and a full-scale system was installed on the salmon packer *Nootka Chief*. In practical use, the unloading system has duplicated the success of test runs on the working model.

Investigation into the engineering and economic features of the equipment are to continue.

"BLOWN" FISH OILS PRODUCED BY SCIENTISTS:

"Blown" fish oils that could be used as additives to conventional lubricants have been produced by scientists of the Halifax technological station of the Fisheries Research Board of Canada in their search for new ways to develop byproducts from the fishery resources of the Atlantic. Although fatty oils have been used as lubricants for centuries, often in the form of soaps, there has been relatively little use for marine oils for lubrication.



However, the Halifax station's scientists have concluded successful experiments with cod-liver oil and herring oil which may interest processors and oil companies in the use of these products as additives to lubricants. Details of the project were given in Ottawa at the annual meeting of the Research Board.

Before the advent of petroleum many fats and oils from plants and animals, including even butter, were used as lubricants. Within the last few decades the direct use of these materials as lubricants has practically vanished. Some, however, are still used as additives in certain lubricants since they adhere to metal surfaces and improve the stability of the oil layer between the surfaces. The oil most commonly used for this purpose today is derived from rapeseed.

To improve the characteristics of these oils, large quantities of air are blown through the oils at high temperatures. This thickens the oil to improve its viscosity characteristics and at the same time stabilizes it against

Canada (Contd.):

further decomposition in operation at high temperatures often found in machines.

Since the cost of "blown" vegetable oil is high as compared to marine oil, it is possible that this fact could create more interest by oil companies in the use of fish oils as additives. The Halifax experiment has shown that by careful processing a "blown" marine oil can be produced that would meet most specifications required by oil companies.

The project has not been geared to produce oil in sufficient quantity for evaluation by oil companies. However, the process has been perfected and is available to Canadian industry if it wishes to use it.

STUDIES ON HORMONES IN SALMON:

Studies on hormones in Pacific salmon have recently been extended to include the Atlantic salmon. All five species of Pacific salmon die after spawning while many Atlantic salmon do not. The present studies are being undertaken with a view to gaining a better understanding of this phenomenon, and were outlined at the annual meeting of the Fisheries Research Board of Canada.

Results to date show that there is an impaired elimination of hormones in spawned Pacific salmon which does not occur with spawned Atlantic salmon. This research is being carried out at the Board's technological station in Halifax.

PLANKTON RESEARCH:

Plankton--the very foundation of the pyramid of life in the sea--is the subject of an intensive and stimulating program of research at the Nanaimo Biological Station of the Fisheries Research Board of Canada. Scientists at the British Columbia station are opening the door on increased knowledge of the tiny organisms, both plant and animal, which are at the bottom of the food chain of the sea. These microscopic creatures and plants are present in greater numbers and higher concentration than any other form of life in the ocean. Yet, to the present time, serious gaps exist in scientific information about them.

The current research program in this field, described at the Board's annual meet-

ing in Ottawa, is aimed at finding out as much as possible about these members of the phytoplankton and the zooplankton families--the number of different species, how fast each reproduces, how useful they are in the food chain.

To get this information, completely new techniques of investigation have been developed by scientists at the Nanaimo Station. These include a method of isolating a body of water in a submerged plastic sphere where plant organisms were grown under conditions closely approaching those of nature.

To further laboratory research, electronic equipment has been adapted or developed specially for this purpose. Among the new devices is one which may enable scientists to monitor concentrations of new growths of plant organisms in the sea through aerial surveys.

The significance of these studies is enormous. In effect, the basic foodstuffs of the sea support all marine life, as their presence in quantity or otherwise determines the growth and survival of the next higher organism, and so on.

EFFECT OF WINDS, TIDES, AND SEASONS ON OCEAN SURFACE CURRENTS STUDIED:

Progress is being made in assessing the uneven lag of various parts of the ocean surface in responding to such forces as winds, tides, and seasons, according to a report to the annual meeting of the Fisheries Research Board of Canada by its Pacific Oceanographic Group.

Changes in barometric pressure cause winds, it was explained, and winds cause surface currents and a degree of drift which must be taken into account in navigating a vessel. But there is enough lag in each step from cause to effect to enable an expert weatherman on land to collect barometric reports, work out varying probable drifts for a number of different areas, and publish monthly charts.

This interplay of forces is fairly uniform on the open ocean, it was further explained, but nearer the coast is greatly complicated and locally varied by the shape of the sea bottom and the coastline, which may increase or diminish the local effect of wind and tide

Canada (Contd.):

and lengthen or shorten the period of lag in the sea's response.

NEW RESEARCH VESSEL BEING BUILT:

Construction was started early in January 1962 on a new ocean-going research vessel--the CGS "G. B. Reed." The G. B. Reed is to operate in North Pacific waters.

The 177-foot vessel, which will cost approximately \$1.8 million, is being built in Victoria, B. C. The construction schedule calls for launching in September 1962 and delivery to the Fisheries Research Board of Canada in November.

The G. B. Reed will be a sistership to the Board's A. T. Cameron which operates in the Northwest Atlantic.

The new vessel will be, in effect, a floating scientific laboratory, and her facilities will incorporate the very latest equipment to enable scientists to carry out work at sea. Investigations in the North Pacific Ocean will include those required of Canada under the International North Pacific Fisheries Commission.

The G. B. Reed will have a cruising range of 8,500 miles and trips lasting 4 to 5 weeks will be possible. It is estimated that the vessel will be at sea for up to 250 days each year. A single high-powered Diesel engine will give the ship a cruising speed of 12 knots. Like the laboratory facilities, the navigational and fish-finding equipment will be the most modern available.

The vessel will be equipped with bottom and midwater trawls, gill nets, long lines, and other specialized fishing gear as well as winches and rigging for conventional oceanographic survey operations.

The vessel will join a fleet of four research vessels operated by the Fisheries Research Board of Canada on the Pacific Coast. They are the A. P. Knight, the Investigator I, the Alta, and the Noctiluca. The largest is the A. P. Knight, a 77-footer.

The home port of the G. B. Reed will be Victoria, B. C., but the scientific staff will

be from the Nanaimo Biological Station of the Fisheries Research Board of Canada.

Note: See Commercial Fisheries Review, August 1961 p. 59.

COMMERCIAL FISHING AREAS EXPANDED IN NORTHWEST TERRITORIES:

Commercial fishing in the Northwest Territories, hitherto restricted to Great Slave Lake in Mackenzie District, has been expanded to include 8 designated areas in the Mackenzie and Keewatin districts on a rotating basis, the Canadian Department of Fisheries announced early in December 1961.

Quotas computed on annual catch limit rates have been set for each of the lakes in the 8 areas. In 6 of the areas each lake will be open for two years or until its quota has been filled, after which it will be closed for 4 years. In the other two areas, the maximum two-year opening will be followed by a two-year closure.

Commercial fishing in some lakes, designated as experimental areas, will be confined to a short summer season. In the remainder, fishing will be allowed on a year-round basis within the restrictions of the quota system.

Operations on Great Slave Lake, which has been fished commercially for the past 16 years, will continue to be governed by existing regulations.

The only other commercial fishing operations in the Northwest Territories are the Arctic char fishery recently developed through Eskimo cooperatives. (The Fisherman, December 8, 1961.)

NEW BRUNSWICK FISH MEAL PRICES, DECEMBER 1961:

Fish-meal prices (60-percent protein) quoted by New Brunswick producers late in December 1961 and late in November 1961 averaged about C\$120 a short ton (\$2.00 a protein unit) for both exports and domestic sales. The price has remained the same since late July 1961. (United States Consulate, Saint John, N. B., Canada, December 28, 1961.)



Denmark

FLATFISH FILLETING MACHINE TESTED:

A filleting machine for flatfish was reported operating successfully for two weeks as of mid-December 1961 in the plant of the Esbjerg fishery exporter who invented it, according to the November 30 issue of the daily newspaper, *Vestkysten*. The inventor, I.C.C. Dyekjaers, reports the machine, which was constructed in Lubeck, West Germany, cuts fillets in an excellent manner but a number of months of operation under regular production will be required before it can be fully tested. Numerous filleting plants in Denmark have ordered the new machine from the Lubeck factory but the latter will await further operating reports before making deliveries in any quantity. (Fisheries Attache, United States Embassy, Copenhagen, report of December 13, 1961.)

4TH INTERNATIONAL FISHERIES TRADE FAIR:

The 4th International Fisheries Trade Fair 1962 will take place in Copenhagen, April 14-23, 1962. Billed as the world's largest trade fair for fisheries, it will be held in The Forum, Scandinavia's largest exhibition hall. About 85 percent of the exhibition space already has been reserved. In the current list of 115 exhibitors from 14 countries, the United States was represented by five manufacturers as of early December 1961.

Exhibitors plan to show the most recent developments in fishing gear, motors and engines, navigation equipment, processing machinery, etc. At the 3rd Fair, held in Copenhagen, September 25-October 4, 1959, exhibitors reportedly made sales of almost US\$29 million. Visitors are expected from at least 33 countries.

Denmark's Fisheries Minister is patron for the Fair, and it is supported also by the Danish Fisheries Council and the Chamber of Manufacturers. (Fisheries Attache, United States Embassy, Copenhagen, report dated December 5, 1961.)

FISHERY TRENDS, DECEMBER 1961:

Catch in 1961 Sets Record: Preliminary data on Danish fishing craft landings through November 1961 indicate that the 1961 catches of most major species have been significantly larger than in 1960. The year's total will surpass the record landings of 1959 of 638,000 metric tons. Better fish

meal prices favored increased industrial fish landings while the excellent demand for fishery exports expanded food fish production.

Common Market Fisheries Policy: The Danish Fisheries Ministry has not scheduled formal meetings with representatives of other countries for discussions leading to development of a fisheries policy for the Common Market. However, the topic is becoming of greater interest among member and prospective member countries. National fishery representatives do discuss the subject informally at meetings called for other purposes. It undoubtedly was discussed at the committee meeting of fishery administrators in London the week of December 11 under the auspices of the Permanent Commission of the International Fisheries Convention of 1946.

Fisheries Ministry Proposes Aid for Exporters: Two proposals of the Fisheries Ministry to aid Danish fish exporters are expected to be recommended to the Government shortly. One would have the Government assume the cost of the fishery export control expenses which are now met by a two-tenths of one percent tax on exports paid by the exporters. In recent years exports have been valued at more than 400 million kroner (US\$58 million). Thus, the saving to exporters would be over 800,000 kroner (\$116,000). Agriculture is seeking the same relief. The second proposal involves increasing the sum allotted for export promotion from the current 50,000 kroner (\$7,250) to 175,000 kroner (\$25,400) the first year and to possibly 200,000 kroner (\$29,000) annually later.

Costs and Earnings of Fishermen to be Studied: The total income of Danish fishermen has increased this year, making it difficult for them to convince others that the fishing industry has economic problems. The fishermen contend that increases in operating costs far exceed the increases in income but have supplied no specific accounting of their operations which would demonstrate their profits or losses. Earlier attempts to obtain such information were unsuccessful. The Committee on Profits and Losses of the Fisheries Commission (consists of 27 members from the fishing industry, the Parliament, and the Fisheries Ministry; it was established by the Ministry on June 27, 1961) is making a renewed attempt to secure the desired information which is meeting with much greater success in the preliminary stages. Questionnaires were being prepared in December 1961 in final form for distribution.

Minimum Size of Plaice Increased: The Danish Fisheries Association has sent a proposal to its 160 local organizations that the minimum size for plaice (*Pleuronectes platessa*) be voluntarily raised from 26 to 27 centimeters (10.2 to 10.6 inches) in order to decrease market supplies. The order would remain in effect until further notice. Earlier this year the Association sought a minimum price regulation but because of the time required has shifted to a larger minimum size fish.

There were many complaints about the low prices of plaice in 1961 with the smaller sizes selling, at times, at such low levels they were bought for mink food and reduction purposes. It was contended that even the larger more desirable sizes sold, on occasion, for one krone per kg. (6.6 U.S. cents a pound) under what was characterized as a "dumping" price.

The increase in the minimum size is expected to decrease landings significantly. Danish biologists favor the proposal in the interest of greater protection for the resource. The fishery for plaice is Denmark's most valuable single fishery.

Pond Trout Association Formed: Pond brook or rainbow trout growers are forming a new association to handle their mutual interests with governmental authorities, including such problems as tax questions, pollution problems, etc. A former association, which also was concerned with trade problems, disbanded in 1960 after disagreements over marketing matters.

Funds Available for Increasing Fisheries Productivity: Suggestions for the expenditure of 75,000 kroner (\$10,900) for increasing productivity in the Danish fisheries have been invited from the industry by the Fisheries Ministry. The advice

was due December 11, 1961, and was expected to concern exploratory fishing, and improvements in vessel and gear equipment and operations. The funds represent the fishing industry's allotment from a larger fund available to other industries.

Two New Cooperative Filletting Plants Proposed: Fishermen in Esbjerg are considering the establishment of two new cooperative filletting plants. The November "buyers strike," which developed from a dispute over adherence to auction regulations, stimulated the Esbjerg Fisheries Association to initiate a plan for a cooperative filletting plant owned by fishermen. While it is recognized considerable capital will be required, the opportunity to acquire an outlet for their catches, which they will control, has induced more than 30 fishermen to sign up for shares valued at 100,000 kroner (\$14,500).

Andelsildeliefabrikken (The Cooperative Herring Oil Factory) in Esbjerg is one of the world's largest fish meal and fish oil plants. Its management has become interested in establishing a filletting plant because about 50 of its more than 250 shareholders now fish exclusively for food fish rather than industrial fish. Preliminary investigations of the project are under way with regard to construction costs, equipment, markets, etc., so that a comprehensive proposal may be presented to members at the forthcoming general meeting. (December 13, 1961, report from the Fisheries Attache, United States Embassy, Copenhagen.)

Note: Values converted at rate of 1 kroner equal US\$0.145.



El Salvador

SHRIMP FISHERY TRENDS:

Based on preliminary recommendations, the Government as of late 1961 suspended the issuance of new licenses to catch shrimp until a study of shrimp possibilities by an expert of the Food and Agriculture Organization (FAO) had been completed. Considerable interest in El Salvador's lobster potential developed during the last few months of 1961, and many persons are making plans to begin lobster fishing.

Boat owners reported a monthly shrimp catch per boat of up to 9,000 pounds as of December 1961, substantially more than the monthly catch of 4,000 pounds of a few months ago but less than the monthly average of 15,000 pounds for the same period of 1960. It is hoped that the FAO study can shed some light on the cause of this decrease, though some observers believe that it is caused by a combination of climatic factors and the increased number of boats in the fishery.

Interest has also developed in shark fishing possibilities, with several fishermen actively planning expansion in that field. (United States Embassy, San Salvador, December 6, 1961.)



Fiji Islands

GOVERNMENT WELCOMES JAPANESE TUNA FISHING BASE:

Japanese plans to establish a large tuna fishing base, complete with freezing and canning facilities, at Levuka, Fiji Islands, appear to be moving forward smoothly. The seven-man survey team headed by a Japanese Diet member, including two other Diet members and a Fisheries Agency official, returned to Tokyo on December 21, 1961, after a two-week on-the-spot survey in Fiji.

Reportedly, the Japanese delegation met with the Fiji House Speaker, who was said to be greatly enthused over Japanese plans to establish a large fishing base and to emigrate 2,000 Japanese to Levuka over a four-year span. Establishment of the base is most welcome since the Fiji Islands have only one industry--sugar--and plans apparently are being made to widely publicize the affair in Fijian newspapers.

Agreement is said to have been made during this trip to have the proposed Levuka base furnish the Japanese tuna mothership fleets operating in nearby seas with supplies and water. (*Suisan Keizai Shimbun*, December 23, 1961.)



France

FIRST BIENNIAL INTERNATIONAL FISHERIES SHOW:

The first Biennale Internationale des Peches (Biannual International Fisheries Show) will be held at Lorient (Morbihan) on the Atlantic shores of Brittany from May 25 to June 3, 1962. The object of the exhibition will be to publicize and promote everything related to the fishing industry from the supertrawler to frozen packaged fish. The fair is being privately sponsored by the city of Lorient and will be the only large fair in France in this field during the year 1962. The last major French fisheries fair was held about two years ago at Boulogne.

American firms can exhibit directly or through local representatives and applications for space should be made directly to the Secretariat General, Biennale Internationale des Peches, Hotel de Ville, Lorient (Morbihan).

France (Contd.):

Covered exhibits will be housed in exhibit halls to be erected for the event. Each hall will be able to accommodate about 50 stands. Fifteen such halls are planned so as to provide enough space for 750 stands. In addition, there will be ample space for out-of-doors exhibits.

Exhibits will cover all aspects of the fishing industry, including supertrawlers. Included in the displays will be mechanical, electronic, radio, radar, and refrigerating equipment; optical instruments; filleting and processing machinery; deep-freezing equipment; retail refrigerator cases; trucks for transporting fresh and frozen fish; etc. ...

The fair will also be highlighted by gastronomic events and by stands devoted to the art of cooking sea products which should have wide appeal to the general public.

Technical conferences are planned but the program has not yet been announced.

consumed in France, facilities for handling and selling frozen foods, including super markets, are being built very rapidly throughout the country. Production and consumption of frozen fish should enjoy a tremendous development in France over the next few years, and there would seem to be an excellent market potential here for equipment and technical know-how in that field.

A significant portion of the fair is being devoted to new types of fishing equipment including electronic devices. European interest in such equipment is strong. (United States Embassy, Paris, November 27, 1961.)



German Federal Republic

FISH MEAL PRICES, NOVEMBER 29, 1961:

Prices reported at Hamburg Commodity Exchange as of November 29, 1961, for fish meal delivered ex-Hamburg warehouse, or c.&f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/Metric Ton 1/	US\$/Short Ton
German	55-60	loco/prompt	577.50	130.98
"	60-65	" "	590.00	133.81
Peruvian	65-70	loco	585.00	132.68
"	65-70	Dec. 1961	585.00	132.68
"	65-70	Jan. 1962	560.00	127.01
"	65-70	Feb.-July 1962	550.00	124.74
Angola	65-70	Dec. 1961/Jan. 1962	602.50	136.65
Portuguese	50-55	Nov. 1961-Jan. 1962	568.00	128.82
Icelandic herring	70-75	Nov. 1961-Feb. 1962	705.00	159.89
South African	65-70	Dec. 1961-Jan. 1962	595.00	134.95
"	65-70	Feb.-May 1962	580.00	131.54

1/Values converted at rate of 4.0 deutsche marks equal US\$1.

Note: "Loco" means where and as it is at the time of sale, and all subsequent expenses to be at buyer's account.

Representatives from all sectors of France's fisheries industry should be attracted to this fair and numerous industry visitors from other European countries can also be expected. The fair would therefore seem to be an excellent vehicle for promoting fishery equipment and products. According to press reports, firms from 26 countries including Japan, Peru, and the Republic of South Africa have already expressed an interest in participating.

Equipment and techniques used in the packaging, freezing, storing and handling of frozen fish should be of particular interest to the French industry. While frozen fish now represents only a small percentage of the total fish

As compared with November 3, 1961, prices on the Hamburg Exchange on November 29, 1961, were up substantially for every type of fish meal. (United States Consulate, Bremen, December 6, 1961.)

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FISH BODY OIL MARKET, SEPTEMBER 1961:

Total West German imports of edible fish body oil in January-September increased from 40,549 metric tons in 1960 to 43,597 tons in 1961; exports increased from 13,367 tons to 15,366 tons. The amount of United States oil in West German imports dropped from 33.8 percent in 1960 to 5.9 percent in 1961, but Peru's share increased from 27.0 percent to 63.8 percent during the same period.

According to the leading local fish oil importer, the use of fish oil in margarine production has been maintained at a fairly steady level by the industry. At present, margarine

German Federal Republic (Contd.):

Table 1 - Federal Republic of Germany Imports and Exports of Edible Fish Body Oils, September 1961 With Comparisons									
Country of Origin	IMPORTS								
	September 1961			Total by Weight		Average Prices 2/			
	September			September		September			
	Quantity	Value 1/		1961	1960	1961	1960	1961	1960
	Metric Tons	1,000 DM	US\$ 1,000	(Percent)		(DM/Metric Tons)		(U.S.¢/Lb.)	
Iceland	376.0	173	43	6.1	0.5	460	385	6.2	4.4
Denmark	607.7	390	96	9.9	18.1	642	649	7.3	7.4
Netherlands	349.2	180	45	5.7	2.1	515	563	5.8	6.4
Norway	191.8	188	47	3.1	18.5	980	826	11.1	9.4
United States	1,216.8	636	159	19.8	21.4	523	672	5.9	7.6
Chile	194.8	105	26	3.2	-	539	714	6.1	8.1
Peru	3,204.7	1,796	449	52.2	23.0	560	530	6.4	6.0
Total	6,141.0	3,468	867	100.0	-	565	-	6.4	-
Total September 1960	3,704.9	2,398	600	-	1/83.6	-	647	-	7.3
Country of Destination	EXPORTS								
	September 1961			Total by Weight		Average Prices 3/			
	September			September		September			
	Quantity	Value 3/		1961	1960	1961	1960	1961	1960
	Metric Tons	1,000 DM	US\$ 1,000	(Percent)		(DM/Metric Tons)		(U.S.¢/Lb.)	
Netherlands	220.0	118	29	19.8	16.5	587	536	6.7	6.1
Norway	1,116.8	691	173	80.2	83.5	675	619	7.7	7.0
Total	1,336.8	809	202	100.0	-	605	-	6.9	-
Total September 1960	1,880.5	1,237	309	-	100.0	-	658	-	7.5

1/Believed to be the value at port of entry in Germany.

2/Other countries: Great Britain - 12.9 percent; Portugal - 0.3 percent; Argentina - 3.2 percent.

3/Believed to be the value at port of shipment in Germany.

Source: Federal Office of Statistics, Wiesbaden.

Note: Values converted at rate of 4 DM equal US\$1.

manufacturers have large fish oil stocks on hand, which reportedly are sufficient to carry their production through April 1962.

United States menhaden oil is currently offered at \$120 per metric ton (5.4 U.S. cents a pound), c.i.f. Rotterdam or Scandinavian port. But according to the local source, little or no business is transacted on this basis. Some sales of U.S. menhaden oil were transacted early in December 1961 at \$116 per ton (5.3 U.S. cents a pound). Peruvian exporters have contracted sales at \$113-\$114 a ton (5.1-5.2 cents a pound), c.i.f. Rotterdam or Scandinavian port for delivery in May 1962, but the early December 1961 price for Peruvian fish oil was \$116 per ton (5.3 cents a pound). According to the local importer, the headquarters of the largest British user and buyer in London has instructed its West European affiliates, including those in West Germany, to stop buying fish oil until at least January 1962. The British firm will reportedly buy if Peru offers fish oil at \$110 per ton (5.0 cents a pound). German fish body oil early in December 1961 was quoted at about DM 450-460 a metric ton (5.1-5.2 cents a pound), ex factory, but it is difficult to get German oil for delivery before March 1962. The local source was optimistic concerning export possibilities for German oil from the 1961/1962 winter production. (United States Consulate, Bremen, December 6, 1961.)



Ghana

JAPANESE FIRM CONSTRUCTING FISH COLD-STORAGE PLANT:

A large Japanese fishing company as of November 1961 was constructing large cold-storage facilities at Tema, Ghana, to handle the catch of its Atlantic trawler fleet, reported to total six trawlers, mostly in the 2,500-ton class. The company is said to be planning on increasing its trawler fleet in the Atlantic Ocean and may build more freezing plants in West Africa. Reportedly, many other foreign fishing firms are interested in joining the Japanese firm in developing new base facilities in West Africa, particularly after the company announced that it planned to establish a large fishing base at Tema. (Shin Suisan Shimbun Sokuho, November 17, 1961.)

FISHERIES DEVELOPMENT AID FROM DENMARK REQUESTED:

The Danish Ambassador to Ghana in Accra has received a letter from the Ghana Na-

Ghana (Contd.):

tional Cooperative Fishing and Marketing Association, Ltd. requesting assistance in establishing joint fisheries ventures in the territorial waters of Ghana. The Association stated it was the only acknowledged national organization for fisheries in Ghana. It wished to receive offers from recognized fishery companies in important fishing countries for a joint fishery operation conducted under a bilateral agreement giving mutual satisfaction. Denmark was approached because it built fishing craft and fished in open ocean waters. It was hoped that private Danish fishing companies would contact the Association with regard to utilizing the very great resources in Ghana's territorial seas. If this was not possible the Association desired a connection through which arrangements could be made for renting fishing craft.

The request was made public in the Danish press in mid-December 1961 and in fishery trade publications. (December 13, 1961, report from the Fisheries Attache, United States Embassy, Copenhagen.)



Iceland

FISHERIES TRENDS, NOVEMBER 1961:

Iceland's herring catch off the southwest coast as of mid-November 1961 continued favorable--so much so that it was feared there were not sufficient contracts to take care of potential sales of herring for salting, normally the preferred process. Salted herring contracts to that date were for 40,000 barrels to the U. S. S. R., 20,000 barrels to Poland, 20,000 barrels to West Germany, and 4,000 barrels to East Germany.

The press announced on November 21 that a special trawler investigating committee headed by the Director of Fisheries had made recommendations to the Government on drastic measures for assisting the Icelandic trawler industry. The recommendations, which were being studied by the Cabinet, were not revealed.

Possible special subsidies for the trawler industry may be foreshadowed by press reminders that the British Parliament recently passed an Act providing for a 10-year as-

sistance program for the British trawler industry. (United States Embassy, Reykjavik, November 22, 1961.)

EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-SEPTEMBER 1961:

Exports of Iceland's most important commodities for January-September 1961 include several fishery items of interest to the United States fisheries. There was a considerable increase in exports of fish meal and herring meal as compared with January-September

Product	Jan.-Sept. 1961		Jan.-Sept. 1960	
	Qty.	Value ¹	Qty.	Value ¹
	Metric Tons	US\$1,000 f.o.b.	Metric Tons	US\$1,000 f.o.b.
Salt herring	19,266	4,015	12,629	1,888
Salt fish	28,243	7,165	21,837	4,837
Stockfish	7,156	3,892	4,202	1,813
Fish on ice	24,326	2,437	16,409	1,274
Frozen fish	31,283	11,005	48,647	13,265
Shrimp & lobster, frozen	354	629	348	550
Herring, frozen	10,069	1,117	5,765	373
Herring oil	11,006	1,515	27,372	2,896
Fish meal	26,694	2,482	8,025	718
Herring meal	22,550	2,713	11,599	1,060
Ocean perch meal	3,581	375	8,368	661

¹/Value converted at rate of 1 kronur equals 2.32 U. S. cents.

1960 (see table), according to the National Bank of Iceland's October 1961 Statistical Bulletin. Exports of frozen fish, herring oil, and ocean perch meal were much lower.

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-SEPTEMBER 1961:

Species	January-September	
	1961	1960
	.. (Metric Tons/)	
Cod	175,589	220,511
Haddock	27,086	23,963
Saithe	8,374	6,712
Ling	4,034	4,374
Wolfish (catfish)	11,338	7,740
Cusk	3,677	5,487
Ocean perch	23,464	40,020
Halibut	1,214	1,187
Herring	250,805	111,084
Shellfish	2,478	1,819
Other	7,712	5,581
Total	515,771	428,478

¹/Except for herring which are landed round, all fish are drawn weight.

FISHING EXCEPTIONALLY GOOD IN 1961:

From the viewpoint of total fish landings as well as for both the north and south coast herring catches, 1961 was ex-

Iceland (Contd.):

pected to show up as a most exceptionally good fishing year for Iceland. Estimates place the total 1961 catch at about 100,000 metric tons more than the 1960 catch of 513,744 tons.

The share of the trawlers in this catch, as compared with that of the motor fishing vessels, was expected to be even less in 1961 than in 1960. According to statistics from the Fisheries Association of Iceland, the trawler catch was 58,449 tons by the end of September 1961 as compared with 85,647 tons at the end of September 1960. The further pushing seaward on March 11, 1961, of the areas protected from trawling operations by the Icelandic Government by inclusion of certain base line areas obviously further tipped the scales in favor of the Icelandic motor fishing boats, which are permitted to fish within the 12-mile and base line areas.

The very exceptional herring catch last summer off the north coast of Iceland was followed by what appears to be an equally record-breaking catch for the south coast. By December 15, 1961, the south coast herring catch was twice as great as that at the same time in 1960, and amounted to 380,257 full barrels of herring, or about 38,000 metric tons, compared with 19,000 tons landed by the same time in 1960. The herring catch during October and November 1961 was reported to have been an all-time record herring catch for Iceland for those two months. Excellent fishing conditions continued to prevail during the first three weeks of December.



Barrels of herring being readied for shipment.

The herring contracts abroad had not been filled as of late December 1961. This was partly due to the rather low fat content of the catch as a whole. About 80,000 barrels of herring had been salted as of December 15, 1961, compared with 33,000 barrels at the same time in 1960. An effort was being made to marinate some 20,000 barrels of herring, which should add considerably to the total value of the catch. A feature of some importance in 1961 was the fresh-freezing of a sizable part of the south coast herring catch. Five trawler loads were landed at German ports the first part of December.

The latest contract for south coast salted herring sales was signed on December 8, 1961. This provided for 40,000 barrels of herring to be delivered to the Soviet Union, making the Soviet contract one for delivery of 80,000 barrels of herring, all of which must be of at least 15-percent fat content. As of the end of December 1961, total foreign salted herring contracts were for 125,000 barrels. The Herring Production Board has also contracted to deliver 20,000 barrels of south coast herring to West Germany and 20,000 barrels to Poland. The remaining 5,000 barrels consist largely of fully processed herring for the United States market, and low-fat content herring for the East German market. The Herring Production Board is attempting to conclude further contracts with the

United States, Rumania, and East Germany. (United States Embassy, Reykjavik, December 27, 1961.)

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PRODUCTION OF PROCESSED FISHERY PRODUCTS AND BYPRODUCTS, JANUARY-SEPTEMBER 1961:

Product	Quantity	Value	
	1,000 Metric Tons	Million Kronur	US\$ 1,000
Frozen:			
Filets	39.3	656.4	15,285
Fish waste	8.9	15.9	370
Herring	8.4	50.1	1,185
Fish roe	0.7	10.1	235
Shrimp and lobster .	0.2	20.0	465
Total Frozen .	57.5	752.5	17,500
Cured:			
Salt fish, dried ...	4.0	79.9	1,858
Salt fish, wet	25.0	255.6	5,944
Stockfish	7.2	185.7	4,319
Herring, salted ...	40.8	343.7	7,993
Fish roe	0.4	3.3	77
Other	1.0	8.3	193
Total Cured ..	78.4	876.5	20,384
Canned:			
Shrimp	1/	4.6	107
Byproducts:			
Meal:			
Herring	35.6	191.6	4,456
Ocean perch	4.4	21.8	507
Lobster	0.2	0.2	5
Liver	0.3	1.5	35
Other	16.7	88.4	2,056
Oil:			
Ocean perch	1.0	4.8	112
Herring	35.0	174.9	4,067
Cod-liver	5.9	35.3	821
Solubles (50% solids)	2.9	5.3	123
Total Byproducts	102.0	523.8	12,182
Miscellaneous:			
Whale products ...	5.5	35.7	830
Trimmings	0.1	1.3	30
Total Misc. .	5.6	37.0	860
Grand Total. .	243.5	2,194.4	51,033
Fish landed abroad	24.1	112.6	2,618
Home consumption	12.8	33.7	784
1/Includes 60 tons of shrimp.			
Note: Values converted at rate of 43 kronur equal US\$1.00.			

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UTILIZATION OF FISHERY LANDINGS:

January-August 1961: Landings of fish and shellfish in January-August 1961 were substantially higher than in the same period of 1961.

Iceland (Contd.):

Table 1 - Iceland's Fishery Landings, January-August, 1960-1961

How Utilized	January-August	
	1961	1960
.. (Metric Tons) ..		
Herring/ for:		
Oil and meal	179,779	87,923
Freezing	10,204	1,944
Salting	54,498	17,266
Fresh on ice	4,119	645
Groundfish/ for:		
Fresh on ice landed abroad	16,960	12,727
Freezing and filleting	118,049	159,693
Salting	63,545	66,585
Stockfish	42,495	50,641
Home consumption	5,595	5,771
Oil and meal	2,998	4,401
Shellfish for:		
Freezing: Lobster	1,410	1,621
Shrimp	304	-
Canning (shrimp)	126	-
Total production	500,082	409,217
1/Whole fish.		
2/Drawn fish.		

January-September 1961: Increased landings of herring were mostly responsible for the increase in landings from 1960 to 1961.

Table 2 - Iceland's Fishery Landings, January-September, 1960-1961

How Utilized	January-September	
	1961	1960
.. (Metric Tons) ..		
Herring/ for:		
Oil and meal	180,767	90,809
Freezing	10,730	2,352
Salting	55,075	17,278
Fresh on ice	4,119	645
Canning	114	-
Groundfish/ for:		
Fresh on ice landed abroad	19,994	15,591
Freezing and filleting	125,506	169,111
Salting	64,532	68,244
Stockfish	43,025	51,359
Home consumption	6,201	6,423
Oil and meal	3,227	4,847
Shellfish for:		
Freezing: Lobster	1,488	1,819
Shrimp	747	-
Canning (shrimp)	243	-
Total production	515,771	428,478
1/Whole fish.		
2/Drawn fish.		



India

INDO-NORWEGIAN FISHERIES DEVELOPMENT PROJECT:

A tripartite agreement was signed in New Delhi on November 27, 1961, between the United Nations, the Government of Norway, and the Government of India to modify and expand the scope of the existing fisheries development project, confined to the state of

Kerala prior to the new agreement. Extension of the Indo-Norwegian fisheries project to cover other maritime states in India is the principal feature of the new agreement.

According to press reports, the Norwegian India Foundation has agreed to contribute Rs. 6.74 million (US\$1.4 million) towards completion of the remaining capital investments under the existing project and Rs. 3.32 million (\$0.7 million) a year for financing the activities envisaged in the new agreement.

The first Indo-Norwegian project, relating to fisheries development in Kerala State, has been in operation now for more than five years based on a tripartite agreement between the United Nations, the Government of Norway, and the Government of India signed in October 1956. The project was formulated with a view to raising the standard of living of the fishermen in the area through higher returns for their work, efficient distribution of fresh fish, improvement of fish products, and improvement of health of the fishing population. The contribution of the Norwegian Government has been in the form of financial and technical assistance viz., equipment, machinery, experts, and fellowships. From its inception through March 31, 1960, the progressive Norwegian expenditure on the project totaled approximately 21.9 million rupees (\$4.6 million). The entire aid has been channeled through the United Nations.

The present agreement is in the nature of an extension pact of the original project. According to available information, the fisheries development work will first be extended to the states of Mysore and Madras because of their contiguity with Kerala and similarity of fishing operations. It is also proposed to establish a new fisheries station at Cochin under the expanded project to conduct marine research and experimental fishing along the sea coast. The Cochin Station will train personnel in fishing operations, manufacture and maintenance of fishing gear, fish processing, and marketing. (United States Embassy, New Delhi, December 12, 1961.)



Israel

JOINT JAPANESE-ISRAELI FISHING COMPANY PLANNED:

A Japanese fishing company is reportedly planning to form a joint Japanese-Israeli fish-

Israel (Contd.):

ing company in Israel this year. Early in 1961 the Japanese firm conducted experimental tuna fishing off the coast of West Africa. Having obtained fairly good results, the firm decided to proceed with arrangements to establish a joint fishing company in Israel. Under this plan, Japan and Israel would each contribute 50 percent towards the establishment of the joint fishing company, which would engage in the production of tuna and fish meal.

Negotiations for this joint venture are currently in progress. However, various conjectures are being made as to whether the Japanese Government would approve this plan since other Japanese fishing companies are already undertaking the establishment of fishing bases on the West African coast. (Shin Suisan Shimbun Sokuho, December 19, 1961.)

Editor's Note: One large Japanese fishing firm has a base in Las Palmas, Canary Islands, and is constructing another at Monrovia, Liberia. Another firm is reported to be constructing cold-storage facilities in Tema, Ghana, and a third firm has a 14,000-ton fish meal factoryship operating in Angolan waters.



Italy

IMPORT LIMIT PLANNED FOR JAPANESE FROZEN TUNA:

Italy plans to limit frozen tuna imports from Japan to 14,000 metric tons a year, according to informed Japanese exporters. Reportedly, Italy hopes to import frozen tuna from other European countries and plans to control imports from Japan by taxing Japanese imports exceeding 14,000 tons. Italy had earlier agreed to admit Japanese frozen tuna free of duty until 1970, and so the Japanese exporters consider this most recent Italian plan as being separate from the earlier agreement made by Italy.

While the foregoing plan purportedly contemplated by Italy appears to be aimed at restricting imports of Japanese tuna, Japanese observers do not feel that it will ever seriously affect Japanese exports, since so far there is no visible evidence of a move to

restrict Italian imports of Japanese frozen tuna. (Shin Suisan Shimbun Sokuho, December 14, 1961.)

COMMERCIAL FISHERIES INDUSTRY:

Italy's commercial marine fisheries industry is based principally at three large ports: Trapani for Sicily and the Mediterranean, Leghorn for the North and Atlantic fisheries, and Ancona for the Adriatic and Ionian Seas. Milan, the river port, is the center for fresh-water fisheries.

But the commercial fisheries industry also operates from these smaller centers: In the Tyrrhenian Sea there are the ports of Sardinia, Liguria, Tuscany, Latium, Campania, Calabria, Messina, and Palermo. The ports situated on the Adriatic are Brindisi, Bari, Malfetta, Manfredonia, Trani, Le Pugli. Finally, there are the ports of Abruzzi, Marche, Emilia, Venetia, Monfalcone, and Trieste.

Italian fishery catches and landings are not sufficient for the domestic demand and the needs of canneries. The country imports fishery products from Netherlands, Iceland, Norway, Spain, and Portugal. When Italy used to be a colonial power, its fisheries were developing along the coasts of Libya, Abyssinia, and the Red Sea. But since World War II Italy remains confined to the Mediterranean.

Tunisia is constantly interfering with fishing operations by seizing Italian boats along the Sicilian coasts. Yugoslavia does the same along the Adriatic coasts.

Motorized trawlers go as far as the Atlantic. The trips of these trawlers last three months on the average. Operating costs are barely covered in spite of increasing fish prices, which in Italy are higher than in all of the neighboring countries. (France Pêche, October 1961.)



Japan

UNITED STATES TUNA MARKET SURVEYED BY JAPANESE FISHERY AGENCY:

In accordance with Japan's Agriculture and Forestry Minister Kono's plan to increase

Japan (Contd.):

tuna exports to the United States, the Fishery Agency undertook a survey of United States fish market trends in November 1961 and was expected to present its findings to the Minister. The Fishery Agency's studies included: (1) fish consumption and fish supply trends in the United States; (2) growth of tuna market demand in the United States; and (3) Japan's tuna production potential to meet tuna demand in the United States. The Agency is said to be considering two alternatives for increasing Japanese tuna production to meet possible increases in tuna exports to the United States: (1) enlarging the 100-ton class vessels (which are considered uneconomical) and permit them to engage in distant-water fishing; and (2) expanding the scope of activities of the coastal fishery to embrace tuna fishing. (*Shin Suisan Shimbun Sokuho*, December 2, 1961.)

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TUNA EXPORTERS SEEK 100 PERCENT LETTER OF CREDIT:

The Japanese Atlantic Tuna Committee has tentatively adopted a 100-percent letter of credit plan to cover exports of frozen tuna to the United States, and plans to negotiate this matter with the United States buyers. United States frozen tuna importers are reported to be opposed to this plan.

Presently, letter of credits issued to Japanese tuna exporters guarantee payments up to 95 percent of the total export price, with 5 percent being withheld to allow for claims against green meat tuna. (*Shin Suisan Shimbun Sokuho*, November 25, 1961.)

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PROPOSED FREIGHT RATE REDUCTION FOR FROZEN TUNA SHIPMENTS TO U.S.:

The Japanese Frozen Foods Exporters Association is carefully studying the Japan Freight Conference's offer to reduce freight rates on frozen tuna shipped to the United States from \$55 to \$50 a short ton. In effecting this reduction, the Freight Conference asks that the Association revert to the use of scheduled freighters for shipping frozen tuna to the United States. By this move, the Conference hopes to win back some of the freight transportation business it lost to trampers (non-scheduled freighters), which today handle approximately 54,000 tons of

approximately 100,000 short tons of frozen tuna annually exported to the United States. While favoring the freight rate reduction, the Association does not intend to give the Freight Conference assurance that trampers would not be used. Four large Japanese fishery firms, which ship much of their cargo by trampers, do not seem to particularly welcome the freight rate reduction offered by the Conference.

Some United States packers are reported to have asked the Association to cooperate with the Conference as soon as possible, since this reduction will affect the price paid for frozen tuna. (*Shin Suisan Shimbun Sokuho*, December 15, 1961.)

* * * * *

ATLANTIC OCEAN FROZEN TUNA EXPORT PRICES:

The Atlantic Ocean Tuna Committee of the Japan Frozen Foods Exporters Association held a meeting on November 21, 1961, to study tuna price revisions and adopted the following prices f.o.b. West Africa for Atlantic Ocean tuna to be exported to the United States in December 1961: albacore \$350 a short ton, yellowfin gilled and gutted \$270 a ton, and dressed yellowfin \$280 a ton.

The Committee also set the export price of frozen tuna f.o.b. Cristobal, Panama Canal Zone, at \$10 per short ton below that of frozen tuna exported to the United States from Japan proper.

At a meeting held on December 1, the Atlantic Ocean Tuna Committee recommended the establishment of the following new floor prices (f.o.b.) for frozen tuna exported to Europe between January and March 1962:

	Yellowfin-Albacore-Bluefin		Big-Eyed	
	Jan.-Mar. 1962	Current Price	Jan.-Mar. 1962	Current Price
Exports to: (Per Metric Ton)			
Italy & Czechoslovakia	\$310	\$290	\$280	\$275
Yugoslavia, Tunisia, & Libya	320	300	290	285

The present system of price classification, one for big-eyed and one for yellowfin tuna, is to be continued, with albacore and bluefin placed under the yellowfin classification. Lots of mixed fish containing more than 50 percent big-eyed tuna shall be sold under the big-eyed price; those containing less than 50 percent big-eyed will be sold under the yellowfin price classification. (*Shin Suisan Shimbun Sokuho*, November 24 and December 5, 1961.)

Translator's Note: As of December 8, 1961, yellowfin, albacore, and bluefin tuna exported to Europe were reportedly selling for around \$340 a metric ton (f.o.b.)

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CANNED TUNA EXPORTERS REJECT PACKERS' PROPOSAL TO RAISE PRICES:

The Japan Export Frozen Tuna Producers Association informed the Japan Canned Foods

Japan (Contd.):

Exporters Association of its desire to increase the prices of canned tuna in brine for export to the United States. The increase requested was 50 cents a case above the current prices of \$9.65 per case (7-oz. 48's) f.o.b. Japan for canned white meat tuna, and \$7.60 per case (7-oz. 48's) f.o.b. Japan for canned light meat tuna. The Producers Association proposed to apply the new prices on 125,000 cases each of canned white and light meat tuna scheduled for sale around December 10, 1961.

The Canned Foods Exporters Association held a meeting on December 5, 1961, at which time it rejected the packers' proposal to raise the export prices of canned tuna in brine. (Suisan Tsushin, December 1; Suisan Keizai Shimbun, December 7, 1961.)

CANNED TUNA IN BRINE EXPORT PRICES RAISED:

Japanese prices of canned tuna in brine for export to the United States were raised for December 1961 sales. Canned white meat No. $\frac{1}{2}$ (48 7-oz. cans a case) was raised \$0.30 per case to \$9.95 per case f.o.b. Japan, while prices on all other sizes of canned white meat tuna were raised \$0.25 per case. Canned light meat tuna was raised \$0.10 per case for all can sizes. This now brings the price of light meat tuna No. $\frac{1}{2}$ (48 7-oz. cans a case) to \$7.70 a case f.o.b. Japan.

A total of 230,000 cases of canned tuna--130,000 cases of white meat tuna and 100,000 cases of light meat tuna--were expected to be offered for the December sales. (Suisan Tsushin, December 15, 1961.)

CANNED TUNA IN BRINE EXPORTS TO UNITED STATES:

According to official information received by the Japan Canned Foods Exporters Association, canned tuna in brine imported into the United States on and after December 15, 1961, has been taxed at the higher tariff rate of 25 percent ad valorem. However, the Association reportedly continued to export canned tuna to the United States, even at the higher tariff rate. The Association expected to continue canned tuna exports to the United States under the higher tariff rate until the

quantity exported reached 50,000 cases in December 1961. (Suisan Tsushin, December 20, 1961.)

EXPORTS OF CANNED TUNA SPECIALTY PRODUCTS:

Sales of canned tuna specialty products (known as "tender tuna"), which a Japanese firm began to export in February 1961, have totaled about 30,000 cases as of early December 1961. Sales were made to West Germany, Australia, Southeast Asia, and Okinawa.

Exports to West Germany averaged approximately 3,000 cases (Japanese flat No. 2 cans) per month, and West Germany is reported to be reselling the Japanese products to other European countries. Exports to other countries consisted mainly of Japanese flat No. 3 cans. The Japanese firm plans to produce between 300,000 and 350,000 cases of canned "tender tuna" in 1962 and hopes to export to West Germany an average of 6,000 cases per month, or about 72,000 cases in 1962.

Initially, exports of canned "tender tuna" consisted mainly of tuna packed in tomato sauce or tuna seasoned with curry, but other varieties of canned "tender tuna" have been exported, including large quantities of "tender tuna" packed in oil and seasoned with soy sauce.

Another canner, which has been packing curry tuna, vegetable tuna, and sandwich tuna since June 1961 has sold some 70,000 cases of those products. These sales were not as high as expected and the reason is the retail price of ¥65 (18 U.S. cents) a "half" can was considered too high. The firm is planning to pack in "quarter" cans in 1962. The firm plans to pack a total of 150,000 cases of one brand of the specialties in 1962. (Suisan Tsushin, December 12, 1961.)

Note: See Commercial Fisheries Review, April 1961 p. 66, and February 1961 p. 52.

NEW CANNED TUNA EXPORT REGULATIONS ANNOUNCED:

On December 1, 1961, the Japanese Ministry of International Trade and Industry (MITI) announced the following new regulations governing exports of canned tuna to the United States, which will be in effect from December 1, 1961, through November 30, 1962.

Japan (Contd.):

I- Limits on variety: Canned tuna exports to the United States shall be limited to the following varieties: canned tuna in brine; tuna spread; pet food.

II- Authorized quantity for export: The total export quota for canned tuna in brine shall be fixed and the allocation of the quota to exporters shall be computed as follows:

A- Export quotas shall be allocated on the basis of actual quantities of canned tuna in brine and canned tuna in oil exported to the United States during the period January 1, 1950, through December 31, 1955. In allocating quotas, quantities of less than 10 cases shall be counted as 10 cases.

B- Exporters receiving allocations of less than 1,000 cases under the above method of calculation shall be assigned the following adjusted quotas: (1) exporters allotted between 10 and 300 cases shall be allocated 500 cases; (2) exporters allotted between 300 and 500 cases shall be allocated 800 cases; and (3) exporters allotted between 500 and 990 cases shall be allocated 1,000 cases.

III- Supplementary documents: Exporters applying for approval to export canned tuna in brine to the United States must submit either one of the following two documents with their applications:

A- Export certificate issued by the Japan Canned Foods Exporters Association showing quantity of export.

B- Documentary proof of sales contract concluded with the Tokyo Canned Tuna Sales Company, Ltd. For members of the Japan Canned Foods Exporters Association, documentary proof of sales contract concluded with the Tokyo Canned Tuna Sales Company may be substituted in lieu of the Exporters Association's export certificate until such time that the Association's "Regulation on quantities of canned tuna to be exported to the United States" are released. Export quotas covered in the Association's regulation shall be based on can size No. 2 48's (U.S. No. 1 7-oz. 48's) as the standard case. Conversion rates for canned tuna of other sizes shall be as follows:

Japanese Can and Case Size	Equivalent U.S. Can and Case Size	Conversion Factor
Tuna No. 1 can, 24's	13-oz. 24's	0.94
Tuna No. 3 can, 48's	3-1/4-oz. 48's	0.48
Tuna 2-kg. cans, 6's	4-lb. 6's	1.16

IV- Tuna spread and pet food: Exporters applying for approval to export tuna spread and pet food to the United States must submit the following documents:

A- Tuna spread - Certificate of inspection issued by the Canned Foods Inspection Association.

B- Pet food - Certificate of inspection issued by the Ministry of Agriculture and Forestry.

V- Country of destination: The term "United States" as used in the regulation refers to the United States of America, District of Columbia, Puerto Rico, Virgin Islands, Panama Canal Zone, Guam Island, Samoa, Wake Island, Midway Island, Canton and Enderbury Islands (Phoenix Islands group), and St. Thomas Island.

VI- Export performance report: With the exception of members of the Canned Foods Exporters Association, all exporters applying for approval to export canned tuna in brine to the United States must submit to MITI by December 12, 1961, export licenses (customs clearance forms) covering the period January 1, 1950, through December 31, 1955, for certification of their export records. (Suisan Keizai Shimbun, December 2, 1961.)

EXPORT TO U. S. OF CANNED TUNA PACKED BY MALAYAN-JAPANESE CANNERY APPROVED:

The Japanese Fisheries Agency in December 1961 was reported to have approved the application to export canned tuna in brine to the United States submitted by the overseas company, acting as sales agent for the jointly-operated Malayan-Japanese tuna company located in Penang, Malaya. The Malayan cannery reportedly is facing a financial crisis and the Fisheries Agency, rather than permit that company to fail, has approved its export application but has indicated that the quantity for export would be less than the 46,000 cases requested by that company. Opinion is that the Agency will likely set that company's export quota at 30,000 odd cases.

The Malayan cannery was packing only canned tuna in oil for export to Europe. Its production of canned tuna in oil was 18,020 cases (48 No. 1/2 or 7-oz. cans) July-December 1960, 44,000 cases January-July 1961, and an estimated 35,000 cases July-December 1961.

The Fishery Agency's approval of the Malayan firm's application to export canned tuna in brine to the United States marks a significant departure from established policy. In the past, Japanese overseas fishing establishments have been prohibited from exporting their canned products directly to the United States. Also, in this same vein, exports of Japanese frozen tuna to foreign countries which would likely export canned tuna products to the United States, and thereby compete directly with Japanese canned tuna exports to the United States, have been prohibited.

Considerable speculation is going on in Japan as to measures the Fisheries Agency may adopt in handling future requests to establish canning facilities abroad and to export canned tuna produced at these overseas bases to the United States. Firms with bases in New Hebrides, North Borneo, Argentina, and Brazil, are reported to be equipped to immediately undertake such an operation. Also, the Fisheries Agency is now expected to have a more difficult time in refusing requests from such countries like Spain to import tuna caught by Japanese vessels operating in the Atlantic Ocean. Such requests until now have been refused since those countries would be competing directly with Japan for the United States canned tuna market.

The initial establishment of the Malayan-Japanese tuna firm had been strongly opposed by the Japanese tuna canning industry on the grounds that it would not be possible for that company to make a go of it merely by packing canned tuna in oil for export to Europe, and that eventually that company would seek to export its products to the United States. Despite this strong opposition from the canning industry, the Fisheries Agency and the parent of the Malayan firm established the joint Malayan-Japanese firm in Penang. (Suisan Tsushin, December 21 & 25, 1961.)

WINTER ALBACORE TUNA FISHERY UNDER WAY:

Japanese fishing for winter albacore was concentrated as of mid-December 1961 around 38° N. latitude, east of Kinkazan, Miyagi Prefecture, replacing good mackerel-pike fishing and the prolonged skipjack tuna fishing season in that area.

The Sumiyoshi Maru No. 18 (145 tons) of Tokushima Prefecture landed its final mackerel-pike catch in Shiogama around mid-December and was making preparations for win-

Japan (Contd.):

ter albacore fishing, loading bait and other necessary materials. It was expected to sail for the above fishing ground with a number of vessels from Shizuoka and Mie Prefectures. Winter albacore fishing was expected to be in full swing when the vessels arrived on the fishing ground. (Suisan Keizai Shimbun, December 16, 1961.)

YAIZU FISHERY LANDINGS,
NOVEMBER 1961:

A total of 8,875 metric tons of fish were landed at Yaizu, leading Japanese tuna fishing port, during November 1961. (Suisan Keizai Shimbun, December 9, 1961.)

Yaizu Fishery Landings, Principal Species, November 1961			
Species	Landings	Ex-Vessel Value	Average Price
	Metric Tons	US\$	US\$/Metric Ton
Bluefin	5,546	1,483,755	\$268
Albacore	344	134,086	390
Skipjack	1,588	312,119	197
Mackerel	139	26,386	190

FORECAST FOR TUNA FISHING
IN EASTERN PACIFIC:

The Kanagawa Prefecture Fisheries Experimental Station in Japan released in mid-December 1961 its forecast of tuna fishing in January 1962 for the eastern Pacific. The estimate was given on the basis of metric tons per 800 hooks.

Second Fishing Area (5°-20° N. latitude, east of 150° W. longitude): Over the entire sea area west of 110° W. longitude, from 5°-13° N. latitude, the black marlin catch was expected to be 0.42 ton. The big-eyed catch east of 130° W. longitude was forecast at 5 tons, while west of that line it was expected to be only 0.8 ton. Also, the yellowfin catch east of 130° W. longitude was expected to be higher than west of that line at 0.5 ton in the east and 0.2 ton in the west.

Third Fishing Area (5° N. latitude-10° S. latitude, east of 150° W. longitude): A good period for big-eyed fishing was expected in the area from the equator to 5° S. latitude, an increase in catch in the area between 5° and 7° S. latitude, and an end of good fishing in the area between 7° and 10° S. latitude. In both of the first two areas the rate of catch

was expected to be about 5 tons, and 4.2 tons for big-eyed around 110° W. longitude. Yellowfin were expected to move northward from around 10° S. latitude gradually to 4° S. latitude and the catch rate was expected to be 2.6 tons. The black marlin catch was expected to vary from area to area but generally a rate of 0.4 ton was expected.

Fourth Fishing Area (10°-30° S. latitude, east of 150° W. longitude): In the sea area east of the Pomotsu Islands 18°-23° S. latitude, albacore catch rate was to be comparatively high at about 1.8 tons. The catch rate should be some 1.4 tons for black marlin in the area around those islands. Also, the area at 120° W. longitude with a catch rate of 4 tons is an extension of the third fishing area in the Eastern Pacific. (Japanese periodical, December 18, 1961.)

TUNA MOTHERSHIP CATCH
IN SOUTH PACIFIC AREA:

A Japanese fishing company's tuna mothership Jinjo Maru (7,161 gross tons), which operated in the South Pacific Ocean, was scheduled to return to Tokyo on November 27, 1961. This mothership, which was accompanied by 40 catcher vessels, is reported to have caught a season total of 3,200 metric tons of fish, of which albacore tuna made up 36 percent (1,152 metric tons) and yellowfin tuna 28 percent (896 metric tons). (Hokkai Suisan, November 20, 1961.)

SOUTH PACIFIC TUNA OPERATIONS:

The Japanese tuna mothership No. 3 Tenyo Maru operating in the South Pacific Ocean was reported to have caught 771 metric tons of albacore and 130 metric tons of yellowfin tuna, and 495 metric tons of spearfish, as of December 20, 1961. (Suisan Keizai Shimbun, December 24, 1961.)

The Japanese tuna long-line vessel Choko Maru (159 gross tons) was reported in mid-December 1961 to be returning to its home port at Kesennuma in northern Japan with a load of fish taken from the waters east of Australia. The Choko Maru, which operated in the area bounded by 150° to 157° E. longitude and 14° to 24° S. latitude, caught a total of 80.6 short tons of fish taken in 31 sets, primarily albacore, followed by spearfish

Japan (Contd.):

and yellowfin tuna. (Suisan Keizai Shimbun, December 20, 1961.)

DISTRIBUTION OF TUNA IN THE PACIFIC OCEAN:

A lecture on the distribution of tuna in the Pacific Ocean was given by the Director of the Nankai-ku Fisheries Research Institute in Magasaki, Kyushu, under the sponsorship of the Fisheries Section, Nagasaki Municipality.

The substance of this lecture was that the distribution of tuna in the Pacific Ocean is a belt-like area stretching from east to west centered around the equator. The higher the latitude, the less the fish schools are distributed. Each tuna species, however, lives in a certain section of the belt, different from others. There are known to be about 13 sections.

Tuna migration may be classified into two types; one under the same living conditions and the other caused by a change of living conditions which usually takes place in March and September of each year.

Spawning occurs in a wide area for a considerable length of time and the number of eggs from one fish is more than one million. Striped marlin spawn in comparatively high latitude areas.

Japanese waters are not particularly favorable to tuna, but the living conditions of tuna (including seasonal conditions) are fairly well known and planned production can be carried out.

In the Pacific, the more easterly a section is located, the larger the size of fish found in that section. The thickness of the schools remains the same throughout the year and fishermen can build vessels based on their judgment of the species in which they are primarily interested and their ability to swim. (Suisan Keizai Shimbun, November 17, 1961, and other periodicals.)

TROPICAL ATLANTIC TUNA FISHING IMPROVES:

According to Japanese reports coming from the fishing areas, albacore tuna fishing

by Japanese vessels off Recife, Brazil, began to improve in September 1961. November-December 1961 yellowfin and albacore tuna fishing off Africa also entered the seasonal peak. But fishing was not yet completely satisfactory because the average catch per day for a 400-ton long-line vessel was 8-9 metric tons, which is the same as in 1960. Seasonal peak fishing was expected to last until January 1962 and much was expected of future fishing.

Export demand for frozen tuna from Atlantic production has held steady since June and July 1961. In fact, the available supply was considered inadequate. For this reason, Atlantic tuna was selling at the export price of around US\$300 per metric ton c.i.f.

Mid-December 1961 export prices for Atlantic frozen tuna were \$310 a metric ton for Italy, \$320 a ton for Yugoslavia and Tunisia, and \$340-\$350 a short ton for albacore transshipped to the United States. These prices were substantially higher than \$260 for Europe and \$310 for transshipment to the United States reported for the same period in 1960. Compared with the same period in 1960, total exports of frozen Atlantic tuna April-November 1961 increased 10 percent in quantity and about 20 percent in value.

Reflecting the gradual rise in frozen Atlantic tuna prices in the United States, tuna shipped directly from Japanese ports as of mid-December 1961 was priced \$70-\$80 a short ton higher than in 1960. The tuna catch in the Pacific towards the last part of 1961 was showing the same tendency as Atlantic tuna when compared with 1960. For frozen Pacific tuna as of mid-December 1961, prices were \$390 per short ton f.o.b. for albacore and \$340-\$350 for yellowfin shipped directly from Japan. The prices were \$310 on albacore and \$270 on yellowfin in the same period of 1960. (Suisan Keizai Shimbun, December 18, 1961.)

TUNA FISHING IN THE ATLANTIC OCEAN SLOW IN 1961:

Japanese tuna fishing in the Atlantic Ocean was reported slow during 1961. Late in December 1961, a total of 52 Japanese tuna vessels were operating in the Atlantic Ocean. About 40 of those were concentrated in the albacore fishing area off the coast of South America. While the catch increased somewhat early in December 1961, fishing was still

Japan (Contd.):

generally slow compared with the same period of 1960.

Yellowfin and big-eyed tuna catches off the coast of West Africa were reported as very light, with yellowfin making up from 20 to 40 percent of the daily landings.

The number of tuna vessels operating in the Atlantic Ocean during 1961 was 10 less than in 1960. However, 6 vessels are scheduled to be added to the tuna fleet in 1962, which will bring the Atlantic Ocean tuna fleet up to 58. (Suisan Tsushin, December 20, 1961.)

JAPANESE HOPE TO ESTABLISH FROZEN TUNA WAREHOUSE IN ATLANTIC AREA:

At the Government-Industry meeting of the Japanese Export Trade Promotion Council held in early November 1961, the Japanese frozen tuna industry submitted a proposal to establish a warehouse (cold-storage cooperative) at Ghana, West Africa, which would be used to regulate the flow of frozen tuna in the Atlantic Ocean area to stabilize market conditions.

This proposal is not new and was originally made in May 1961. At that time, the catch of Atlantic Ocean tuna had been expected to surpass the 1960 high catch. To prevent a disruption in the European tuna market, as had happened in the past, tuna vessel operators had urged the establishment of a warehouse in the Atlantic, and some fishing companies strongly urged that they be permitted to use the fishing base being built at Monrovia, Liberia, by a large Japanese fishing company. The catch in 1961 fell way below expectations and interest in the warehouse plan died down.

Specifically, the tuna industry wants to establish a warehouse to: (1) separate catches according to countries of destination; (2) carry out quality control whereby rejected fish would be shipped back to Japan; (3) regulate the flow of tuna to control market prices. Eventually, fish canning and fish ham-sausage manufacturing plants would be established at the warehouse site. The warehouse center would operate as a multiple enterprise and handle the catch of the Japanese Atlantic

trawl fleet as well. The tuna industry wants the Japanese Government to finance this project. However, Government authorities are insisting that before this plan can be implemented, the tuna industry should submit a concrete detailed proposal.

As far as the joint use of the large Japanese fishing company's base at Monrovia is concerned, the firm reportedly has no objection to other Japanese fishing firms utilizing its fishing base, which is expected to be completed in mid-1962. This base, which is being jointly financed by the large Japanese firm and the Nigerian Government, will have a 2,000-ton capacity cold-storage plant. (Suisan Keizai Shimbun, November 22, 1961.)

STUDIES ON DISCOVERING "GREEN MEAT" TUNA ABOARD THE VESSEL:

The Japanese have been studying means of determining aboard the vessel what type of tuna will show up as "green meat" tuna after it is processed for canning.

For yellowfin, the studies reveal that it is impossible to tell whether green meat is related to the color of meat before processing aboard the vessel. Fish weighing 66-88 pounds were found to be free from the occurrence of green tuna. There was no connection between occurrence of green tuna and area of capture for that size fish. Fish weighing more than 111 pounds and some of that size caught in the Caribbean Sea were found to include fish with green meat. Whether or not the tuna processed for canning is fresh or frozen does not seem to make any difference as far as the occurrence of green meat is concerned.

For albacore, generally speaking, fish weighing around 44 pounds were free from green tuna but that was not true of the smaller fish. No green meat developed in the albacore caught in the Caribbean Sea, but unless handled properly it was learned that dark-colored meat might develop. Fish caught near 40° north and south latitudes were quite variable in quality and color.

Generally speaking, green meat developed in big-eyed tuna. For Australian tuna, most medium fish developed a meat of dark color, but since the quantity studied was small it was difficult to draw any conclusions. (Suisan Keizai Shimbun, December 6, 1961.)

Japan (Contd.):

CANNED TUNA PACK, 1960:

Of the almost 6.0 million standard cases of tuna products canned in Japan, almost 3.3 million cases were tuna canned in brine or oil, and the balance was specialty tuna prod-

Japanese Pack of Canned Tuna, 1960	
Product	Std. Cases (48 7-oz. Cans)
Tuna (other than skipjack) in brine	1,643,188
" " " " in oil	410,991
Skipjack in brine	473,501
" " " " in oil	761,375
Total in brine or oil	3,289,055
Tuna (other than skipjack), seasoned	378,223
" " " " flake	1,137,109
" " " " cooked with vegetables	43,311
" " " " in jelly	34,635
" " " " in seasoning	55,544
" " " " in tomato sauce	60,892
" " " " stewed	39,466
" " " " cooked with curry	65,440
" " " " cooked with soy sauce	18,872
Tuna, other products	1,342
Skipjack, seasoned	175,595
" " flake	360,168
" " in jelly	42,302
" " broiled	2
" " cooked with vegetables	203,558
" " in tomato sauce	15
" " other forms	49,116
Total specialty products	2,665,590
Grand Total	5,954,645

ucts. Of the almost 3.3 million cases packed in brine or oil, 2.1 million cases were packed in brine and almost 1.2 million cases packed in oil.

Note: See Commercial Fisheries Review, December 1961 p. 73.

EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-JUNE 1961:

Exports of canned fishery products during the first six months of 1961 were somewhat

lower than those for the same period in 1960. The decline was general among most of the important products, including canned tuna, crab meat, mackerel-pike, sardines, and salmon.

CANNED MACKEREL EXPORTS AND SUPPLY, APRIL-NOVEMBER 1961:

A total of 612,000 cases of canned jack mackerel (actual number of cases) were approved for export between April and November 1961, according to data compiled by the



Fig. 1 - Miyako, Iwate Prefecture, considered Japan's leading mackerel port. Here the boats, flying colorful pennants, are assembled ready for the opening of the new mackerel season, generally in September.

Japan Export Canned Jack Mackerel Producers Association. Exports to Singapore and West Africa made up over two-thirds of the total exports. Supply of canned jack mackerel as of November 25 totaled slightly over 93,000 actual cases. (Suisan Tsushin, December 1, 1961.)

Japanese Canned Fishery Products Exports, January-June 1961 and 1960					
Product	Jan.-June 1961				Jan.-June 1960
	To U.S.	To Canada	Other Countries	Total	Total
..... (Actual Cases)					
Crab meat	44,183	1,550	62,336	108,069	127,490
Tunas					
in oil	-	105,178	550,346	655,524	711,014
" brine	997,308	-	-	997,308	1,025,009
other types	-	4,683	74,352	79,035	40,877
Mackerel-pike	6,513	80	114,698	121,291	647,034
Sardine	350	-	121,053	121,403	385,654
Horse-mackerel	45	-	293,416	293,461	156,469
Salmon, trout	12,961	111	283,277	296,349	453,695
Other fish	3,266	313	250,580	254,159	166,180
Shellfish	160,840	33,045	36,046	229,931	188,474
Other aquatic products	2,751	113	1,341	4,205	2,643
Total	1,228,217	145,073	1,787,445	3,160,735	3,904,539

Japan (Contd.):

Table 1 - Japanese Exports of Canned Jack Mackerel, April-November 1961

Destination	No. Cases
Singapore	237,068
West Africa	178,875
Indo-China	36,265
Ceylon	34,802
New Guinea	20,309
Borneo	20,148
Middle East	11,506
Hong Kong	8,956
Other	64,160
Total	612,089

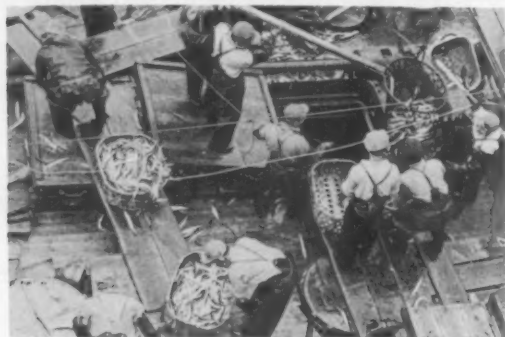


Fig. 2 - Aboard a Japanese mackerel fishing vessel fishermen are packing the fish in baskets for stowing in the hold.

Table 2 - Japanese Exports and Supply of Canned Jack Mackerel

Japanese Can Size	Equivalent U.S. Can Size	No. Cases Exported (4/1-11/25)	No. Cases on Hand (As of Nov. 25)
In tomato sauce:			
No. 1 oval	1-lb. oval 48's	107,746.5	10,928.5
No. 3 oval	1-lb. oval 96's	98,469	2,109
No. 1 small	5-oz. tall 100's	268,441	29,206.5
No. 4	1-lb. tall 48's	57,478	19,639.5
No. 6		7,326.5	25.5
Natural:			
No. 3 oval	1-lb. oval 96's	1,423.5	2,964
No. 2 flat	8-oz. oblong 48's	0	69
No. 1 small	5-oz. tall 100's	34,745	22,143
No. 4	1-lb. tall 48's	36,459	6,722
Total		612,088.5	93,807

SARDINE INDUSTRY:

Japan's fishery for "Iwashi" (sardine, anchovy, and pilchard) is conducted practically the year-round for one or another of those species of fish.

The canning season for sardines is from August to October; anchovies, January to March; pilchards from April to July followed by a second season from October to December.

The annual case pack of sardines for the past five years is: 1956 - 6,000; 1957 - 9,000; 1958 - 12,000; 1959 - 45,000; 1960 - 18,000 cases. The drop in pack from 1959 to 1960 was caused by the short supply of fish in waters off the coast of Japan. The pack of sardines in 1961 totaled 50,000 cases.

Sardines, which include small pilchards, are packed in cottonseed oil in dingley or quarter cans. They are marketed for domestic use only. The only exports during the last five years occurred in 1956 when 1,000 cases were shipped to Hong Kong.

The 1961 "Iwashi" pack other than those packed in dingley cans was made up of large pilchards and anchovies packed in tomato sauce. Pilchard production totaled 622,300 cases of which 240,000 cases were packed in 15-ounce ovals (48 cans per case); 220,000 cases in 7½-ounce ovals (96 cans per case); 147,000 cases in 5-ounce flats (100 cans per case); 7,500 cases in 15-ounce talls (48 cans per case); and 7,800 cases in 8-ounce oblongs (96 cans per case). The entire pack of anchovies which amounted to 4,500 cases was packed in 7½-ounce ovals (96 cans per case).

The number of cases of sardines that Japan could have produced annually for the past five years under full-scale activities is estimated at 1,000,000. This estimate is based on two important factors: (1) that the fish would have been in plentiful supply; and (2) that a strong market demand would have existed for the canned product.

The Japan Canned Sardine Cannery Association states that there are approximately 100 plants in Japan canning sardines. The average wage per worker per month is dependent on the size of the plant in which employed. In small plants (less than 30 employees) the average wage per month is US\$30. In medium size plants (30 to 99 employees) the average wage per month is \$27. In large plants (100 to 150 employees) \$25 a month.

In 1961 ex-vessel prices averaged \$69 per metric ton for pilchards and \$52 per metric ton for anchovies.

The number of sardines packed in dingley-type cans is 14 to 15. No packs of 4 to 5 or 6 to 8 count fish are made. Prices as of mid-December 1961 were: sardines (dingley cans, 100 cans per case, key or keyless) f.o.b. Japan \$35. (United States Embassy, Tokyo, December 12, 1961.)

CANNED SARDINE EXPORTS:

Japan's sardine exports for April 1, 1961, to August 31, 1961, totaled 270,520 cases. These consisted of 268,340 cases of pilchards and 2,180 cases of anchovies. Both species were packed in tomato sauce: pilchards packed in 15-ounce and 7½-ounce ovals, 5-ounce flats, 15-ounce talls, and 8-ounce oblongs; and anchovies packed in 7½-ounce ovals.

Shipments to the Philippines totaled 117,834 cases or 43.6 percent of the total exports. Exports (in number of cases) to other areas were: Belgium, 41,432; other European countries 4,076; Middle and Near East, 1,339; West Africa, 42,097; other African countries, 5; Ceylon, 50; Burma, 15,987; Singapore and Malaya, 5,166; Hong Kong, 5,279; Indonesia, 13,674; Central and South America, 11,141; other countries 12,440.

During the Japanese fiscal year of 1960 (April 1, 1960-March 31, 1961), 463,561 cases

Japan (Contd.):

of canned sardines were exported, of which 462,613 cases were pilchards and 948 cases were anchovies. A total of 285,059 cases or 61.5 percent were consigned to the Philippines and 178,502 cases to the other countries mentioned in preceding paragraph.

There were no exports of pilchards or anchovies to the United States in 1960 or 1961. (United States Embassy, Tokyo, December 26, 1961.)

CANNING OPERATIONS OF LARGE FISHING COMPANIES EXPAND THROUGH TIE-UPS WITH SMALL PACKERS:

The large Japanese fishing firms are reportedly pushing forward plans to tie up with medium and small packing companies having daily production capacities of between 500 and 1,500 cases. They would supply the small packers with raw material on a year-round basis, which would be packed under their own brands and sold through their extensive sales network. This arrangement, which amounts to packing on a commission basis, would permit major fishing companies to increase the variety of canned food packed under their own labels, reduce brand competition, and establish new sales channels and markets for their products.

Consignment of production poses the problem of pack uniformity and quality control. This reportedly is not a problem at the present time since the production of one kind of product is consigned to only one packer.

Annual domestic consumption of all types of canned food in Japan has risen rapidly in recent years, from 10 million cases in 1955 to 30 million cases in 1957, 40 million cases in 1959, and 50 million cases in 1961. Despite this increase in canned food consumption, the small Japanese packing companies have not fared too well due to increased production cost, the seasonal nature of their operations, lack of sales outlet, and inability to conduct market research. The large fishing companies have now stepped into this picture, providing financial assistance in some cases, and have made arrangements with these small packers for them to pack on a consignment basis, making it possible for these small packers to operate on a year-round basis. This trend, which developed

two years ago, is reported to have greatly accelerated in 1961. (Nippon Suisan Shimbun, November 24, 1961.)

TRAWLING OPERATIONS OFF WEST AFRICA:

A Japanese fishing company plans to operate a trawler of 1,500 tons gross in the Atlantic Ocean off the coast of West Africa from September 1962 to March 1965. This trawler, which is being constructed to replace the company's No. 1 Seiju Maru (600 gross tons), presently operating in the Atlantic Ocean, is scheduled to be dispatched to the Atlantic Ocean after its completion in May 1962. Las Palmas, Canary Island; Genoa and Livorno in Italy; and Gibraltar have been tentatively designated as ports where this trawler can land its catches. (Shin Suisan Shimbun Sokuho, November 16, 1961.)

Translator's Note: Of the four ports mentioned above, Genoa has a cold-storage plant of 3,000-ton capacity, and Livorno and Las Palmas each have cold-storage plants of 2,000-ton capacity.

PLAN TO SURVEY EAST AFRICA FISHERIES:

The Japanese Overseas Fisheries Cooperative Society intends to carry out a fishery investigation in Kenya, Uganda, Tanganyika, and Zanzibar. The aim is to study the possibility of joint commercial fishery enterprises. A team of six members will spend about 40 days in those countries with expenses paid, in part, by the Japanese Government. (Fisheries Economic News, October 6, 1961; Suisan Tsushin, October 7, 1961; Suisan Keizai Shimbun, November 9, 1961.)

FISHERIES AGENCY PERMITS TRAWLING SOUTH OF ALASKA PENINSULA:

On December 22, 1961, the Japanese Fisheries Agency informally notified two large Japanese fishing companies of its intention of letting them operate trawl fleets south of the Alaska Peninsula this winter (principally during January, February, and March), according to Suisan Keizai Shimbun, December 23. The Agency had earlier indicated that it would likely permit the two companies to operate trawl fleets in the eastern Bering Sea this winter, and one of the firms had gone

Japan (Contd.):

ahead and readied the fleet consisting of the mothership Chichibu Maru (5,500 gross tons) and six 250-ton trawlers. All of the trawlers are fitted with steam pipes around the hull to de-ice it during winter operations. According to Hokkai Suisan of December 25, this mothership fleet was expected to depart Hakodate, Hokkaido, on December 28 and remain on the fishing grounds until March 1962. It was expected to operate in the eastern Bering Sea and in the North Pacific Ocean south of the Aleutian Islands and the Alaska Peninsula. At the invitation of the Japanese Government, a U. S. Bureau of Commercial Fisheries biologist is accompanying the fleet to observe operations and to make scientific studies.



Typical Japanese trawler fishing for bottomfish in the Bering Sea and the North Pacific.

The other fishing company was reported to be planning on sending in February 1962 the freezer ship Eiyo Maru (3,000 gross tons) to the eastern Bering Sea accompanied by one 1,500-ton trawler and two 250-ton trawlers, according to Suisan Tsushin, December 21. It is authorized to fish in the North Pacific Ocean west of 145° W. longitude and north of 50° N. latitude. A Canadian biologist was expected to accompany this fleet.

The Suisan Keizai Shimbun states that the following restrictions are being placed on the winter trawling operations:

- (1) Only mothership-type operations will be permitted. Motherships must be over 3,000 gross tons.
- (2) Use of large trawlers will be prohibited.
- (3) Halibut, salmon, king crab, and young herring must not be taken. Catch of salmon and halibut is prohibited east of 175° W.

longitude. Fishing for king crab is prohibited. When any of these species are incidentally caught, they are to be released immediately. Herring under 21 centimeters (8.3 inches) fork length shall not exceed 10 percent of total herring catch per trip.

(4) Long-line gear will be prohibited so as to prevent the taking of halibut.

(5) Operations in the Bering Sea and south of the Alaska Peninsula will be restricted to the waters east of 170° E. longitude. Area includes Bering Sea and waters of North Pacific west of 145° W. longitude and north of 50° N. latitude, exclusive of area of Tokai Maru crab operations north of Alaska peninsula.

The Japanese Government has informed the United States Government that these operations are experimental in nature. In addition, the Japanese Government has assured the United States that any salmon or halibut caught will be returned to the sea; and that Japanese Government inspectors accompanying the fleets will require them to move out of areas in which salmon or halibut are found intermingled with other species of fish.

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NEW FREEZER FACTORYSHIP FOR EASTERN BERING SEA BOTTOMFISH FISHERY:

The newly-constructed freezer factoryship Chichibu Maru (5,500 gross tons) was delivered to a Japanese fishing company at Kobe on December 13, 1961. This factoryship was scheduled to depart for the eastern Bering Sea from Hakodate around December 28, and was to be accompanied by six new 250-ton trawlers. Chichibu Maru's specifications are as follows: total length, 133.2 meters (436.9 feet); beam, 18 meters (59 feet); draft, 7 meters (23feet); gross tonnage, 5,500 metric tons; cruising speed, 13.5 knots; maximum speed, 15.8 knots; and freezing capacity, 185 metric tons per day.

The Bering Sea forerunner of the fleet sailed on November 10, 1961, from its base at Kurihama near Yokosuka for the fishing grounds around the Pribilof Islands. The next vessel sailed on November 11. The forerunner that served as scout for the main fleet was the No. 50 Akebono Maru (1,500-ton trawler).

Japan (Contd.):

Apart from the main fleet, the No. 50 Akebono Maru was expected to engage in general exploratory work and trawling operations around the Pribilofs for some 50 days, and return to Japan late in January with an expected cargo of about 900 metric tons of pollock, rockfish, and cod. (Suisan Keizai Shimbun, December 14, 1961, and other periodicals.)

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BERING SEA BOTTOMFISH FISHERY DEVELOPMENTS:

Eleven Japanese fishing firms which operated bottomfish fishing fleets in the Bering Sea in 1961 have formally formed the Northern Waters Bottom Fish Mothership Association.



Fig. 1 - Washing silt and dirt from catch aboard a Japanese bottomfish fishery factoryship operating in the Bering Sea. Man at right is pushing fish onto conveyor belt leading into cleaning and washing compartment.

The Bottom Fish Association will primarily serve in a liaison capacity and submit petitions to the Government on matters relating to the Northern Waters bottomfish fishery which the Association considers to be of mutual interest to its members.

In early December 1961, the Japanese Fishery Agency submitted a request to the Association that it voluntarily reduce by 30 percent in 1962 the numbers of fleets engaged in bottomfish fishing in the Bering Sea. In 1961 a total of 33 fleets operated. It was suggested to the industry that the fishing companies operating more than two fleets cut down their fleets to their 1960 level of

operations and that the remaining companies not increase their operations beyond their 1961 level. Up to 1960, bottomfish fishing in the Bering Sea was carried out by 12 fleets--5 fish meal factoryships, 4 fleets in the Olynorsk area, and 3 flounder fishing fleets.



Fig. 2 - Cleaning and packing compartment aboard a Japanese bottomfish factoryship in the Bering Sea.

The Association recognizes the necessity of reducing the number of fleets operating in the Bering Sea. It was suggested that the 1962 operations be limited to 24 fleets, a reduction of 9 fleets, but the Association members have not yet been able to agree on how to effect this reduction, and apparently have requested the Agency's assistance. The Agency was expected to announce its decision in early January 1962. (Suisan Keizai Shimbun, December 9 & 19, 1961; Nippon Suisan Shimbun, November 29, 1961.)

* * * * *

SABLEFISH FISHING IN BERING SEA:

Japanese fishing for sablefish or silver cod in northern seas to supplement poor halibut fishing the latter part of 1961 yielded a catch of 2,600 metric tons--more than expected. Some 250 tons were expected to be exported to the United States.

The export was tried for the first time in 1961 and exporting companies have made strenuous efforts to develop a market. Contracts for more than half the amount earmarked for export to the United States had been signed as of mid-November 1961.

The two companies exporting the fish have had difficulties in obtaining 7-8 pound fish in-

Japan (Contd.):

dividually frozen--the type needed for export. Most of the sablefish in northern waters, however, weigh 3-6 pounds each. Individually freezing fish aboard a Japanese mothership is not adaptable to the processing and preservation methods used. While one of the Japanese firms contracted to furnish fish weighing more than 5 pounds each in blocks of 27 pounds, the other of the two firms decided on individually freezing all its fish weighing 5 pounds each in anticipation of future sales. For both companies, sablefish exports are on a trial basis.

As the sablefish are used for smoking, the large oily fish are preferred. Fish suitable for export made up only 10 percent of the entire catch of sablefish.

The firm selling the blocks reports the price as 22 cents a pound c.&f. for fish more than 5 pounds each. The other firm's price for individually-frozen fish is 20-24 cents a pound. In addition to the two firms that are exporting fish frozen aboard their motherships, a third Japanese firm was planning to export to the United States about 100 tons of sablefish landed in Japan. A fourth firm was reported to have stopped exports of sablefish. (Suisan Keizai Shimbun, November 18, 1961.)

BERING SEA HERRING CATCH LIMIT CONTEMPLATED:

Some members of the Northern Waters Bottom Fish Mothership Association, composed of the 11 companies which operated fleets for bottomfish fishing in the Bering Sea in 1961, are reported to favor the estab-

lishment of catch restrictions for herring in 1962 in that area. Catch of herring in the Bering Sea in 1961 was far above expectations, totaling 72,260 metric tons, with 55,000 metric tons frozen. Supply thus far has far exceeded demand and, as of November 20, 1961, members of the Association are reported to have a total of 19,670 metric tons of frozen herring in stock, and the herring market is described as soft.

Opinions are being expressed that the catch of herring in the Bering Sea should be limited to 35,000 to 40,000 metric tons in 1962 and that the Fisheries Agency may possibly set a herring catch limit, in addition to placing a restriction on the number of fleets which will be permitted to operate in the Bering Sea in 1962. (Suisan Tsushin, December 16, 1961.)

BRISTOL BAY KING CRAB OPERATIONS:

The Japanese Fishery Agency announced that it will permit two king crab factoryships to operate in Bristol Bay in 1962, instead of one as in years past. Two fishing firms will be allowed to operate one factoryship and two other firms the second factoryship. The production quota for these two fleets will be 60,000 cases and 70,000 cases of canned crab meat, respectively. Previously, the Japanese operated only one king crab factoryship (Tokei Maru)--operated jointly by three fishing companies. Tokei Maru's production quota in 1961 was 80,000 cases of canned crab meat.

Two large Japanese fishing companies, which have been authorized by the Fisheries Agency to jointly operate one king crab fac-

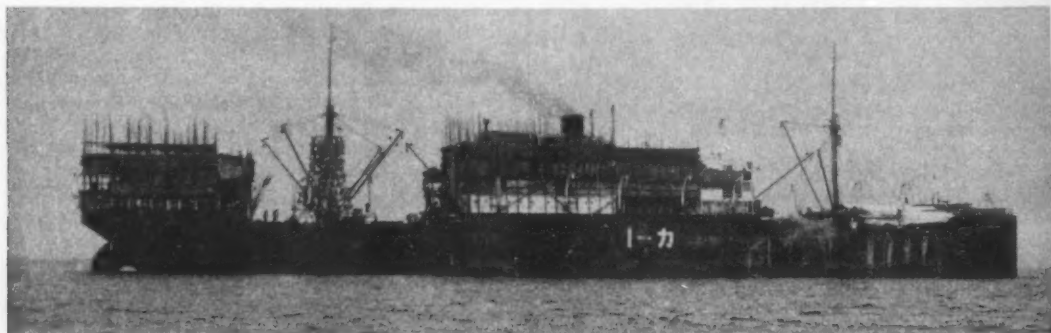


Fig. 1 - Tokei Maru, Japanese king crab factoryship operated jointly by three fishing companies in 1961 in Bristol Bay.

Japan (Contd.):

toryship in Bristol Bay in the spring of 1962 (production quota--70,000 cases), are reported to be negotiating with another fishing company to purchase that company's king crab factoryship, Shiraneyama Maru (5,700 gross tons). The company selling the Shiraneyama Maru plans to replace it with the freighter Seiyo Maru (6,000 gross tons) which it would convert for king crab fishing in the Sea of Okhotsk. The Seiyo Maru is presently employed in transporting fish meal.

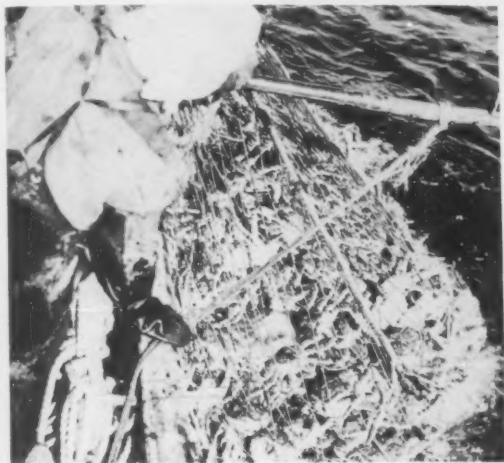


Fig. 2 - A net load of crabs being hauled aboard a Japanese crab fishing vessel.

The other two fishing companies authorized to operate in Bristol Bay are planning to jointly operate the king-crab factoryship Tokei Maru in Bristol Bay in 1962. These two companies have been allocated a quota of 60,000 cases of king crab.



Fig. 3 - A large catch of crabs on the deck of a Japanese king crab mothership.

Separate from the factoryships, one Japanese fishing company will be permitted to continue operating the king crab freezer ship Shinyo Maru (5,630 gross tons) with a new catch quota of 300 metric tons. This represents an increase in the catch quota of 100 metric tons over that previously allocated to the company operating the freezer ship.

The Fishery Agency has not yet clarified its intentions regarding 1962 fall king crab fishing. However, fall king crab fishing is expected to be curtailed to some extent due to increases in catch and production quotas granted for the 1962 spring king crab operations. In the fall of 1961, the Agency permitted three 1,500-ton freezer ships with a total catch target of 700 metric tons to operate in the eastern Bering Sea. In 1962, the Agency is expected to reduce the fall king crab catch quota by 300 tons to a total of 400 tons. (Suisan Keizai Shimbun, December 22, 1961.)

FISH MEAL INDUSTRY STUDY PLANNED:

Reports indicate that the Japanese Fisheries Agency has decided to undertake a study of the Japanese fish meal industry to be completed by March 1962. This decision appears to have been made following continued increases in the export price of Peruvian fish meal, of which Japan imports close to 30,000 metric tons annually.

Japan imported 28,700 metric tons of Peruvian fish meal in FY 1960 (April 1, 1960-March 31, 1961). As of mid-November 1961, Japan has already imported 15,000 metric tons of Peruvian fish meal, and, depending on domestic production in the fall of 1961, it was possible that another 5,000 tons would be imported at \$120 per ton c.i.f. This price is about the same as that of domestic fish meal. The Fisheries Agency believes that it would be to Japan's advantage to increase its domestic production of fish meal, which is higher in quality than the Peruvian product. (Suisan Keizai Shimbun, November 16, 1961.)

FISH MEAL FACTORYSHIP PRODUCTION OFF ANGOLA:

The Japanese fish meal factoryship Ren-shin Maru, 14,094 gross tons, operated by a Japanese fishery firm which commenced operations off the Angolan coast on December 1, 1961, was reported to be producing a little

Japan (Contd.):

over 100 metric tons of fish meal per day as of mid-December 1961. Under arrangements worked out between Angola and Japan, Angolan fishermen deliver their sardine catches to the Japanese factoryship. These deliveries were running 500 to 600 metric tons per day.

The Renshin Maru was scheduled to remain on the fishing grounds off Angola until early February 1962, by which time she hoped to produce 7,300 metric tons of fish meal, of which 2,300 metric tons were to be turned over to Angola.

The two Japanese 120-ton trawlers, Koshin Maru, Nos. 1 and 2, assigned to the Renshin Maru, conducted exploratory fishing off Angola. Reportedly, the two vessels have taken large quantities of sea bream and squid but very little shrimp. (Suisan Tsushin, December 15, 1961, and miscellaneous publications.)

Note: See Commercial Fisheries Review, January 1962 p. November 1961 p. 56, October 1961 p. 67.

OCTOPUS LANDINGS:

Japan's landings of octopus in 1960 totaled 57,601 metric tons. Landings January-August 1961 amounted to 34,081 metric tons. The 1960 average f.o.b. price for frozen octopus was 9.8 U.S. cents a pound. Average monthly f.o.b. prices for 1961 per pound: January, 10.2¢; February, 9.1¢; March, 11.0¢; April, 12.6¢; May, 11.2¢; June, 11.8¢; July, 18.8¢; August, 15.4¢.

日本

Liberia

JAPANESE-ITALIAN FISH PLANT FOR LIBERIA:

A joint Japanese-Italian company has completed plans for a \$400,000 fish processing and freezing plant with a daily freezing capacity of 20 tons and storage capacity of 2,000 tons. Bids will be invited shortly for construction along the north breakwater of the Free Port of Monrovia. Completion is expected by mid-1963. (United States Embassy, Monrovia, October 27, 1961.)



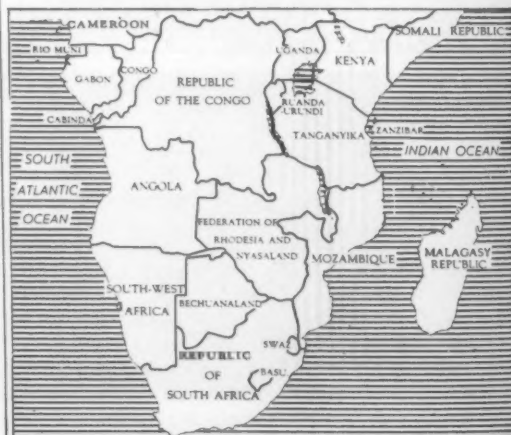
Malagasy Republic

EXPLORATORY FISHING FOR TUNA:

In July, August, and October 1961 the Maran Atha, research vessel of "Centre d'Océanographie et des Pêches" (Center of Oceanography and Fisheries of Nossi-Be sailed to the Majunga region (off the northwest coast of Malagasy) to test tuna fishing with Japanese long-lines in the Mozambique channel. These studies undertaken by the "Centre" at Nossi-Be for several years are carried out under



Fig. 1 - Maran Atha, research vessel of Centre d'Océanographie et des Pêches. Used Japanese long-lines to explore for tuna off northwest coast of Malagasy.



Malagasy Republic (Contd.):



Fig. 2 - Two species of tuna caught by the research vessel Maran Atha with Japanese long lines.

the aegis of the "Office de la Recherche Scientifique et Technique d'Outre-Mer" (Office of Overseas Scientific and Technical Research.

Tests first were carried out with trial gear in order to be able to assess the results immediately. A long line 4 kilometers (2.5 miles) long was used; it had 160 hooks. The line was hauled on board manually. The long line was anchored as close to the port as possible, i.e. somewhat beyond the continental shelf, about 50 km. (31 miles) from the shore.



Fig. 3 - Thresher shark (Alopias pelagicus) caught by the Maran Atha with long lines.

The average daily catch noted at 25 positions of the long line was 215 kg. (473 pounds) of tuna and 250 kg. (550 pounds) of shark. The maximum yield of tuna at one point of the fishing line was 491 kg. (1,080 pounds), the minimum yield 47 kg. (103 pounds).

In the region of Nossi-Be, the "Centre" has been setting up long lines regularly since August 1960. Exploratory fishing by boats of 6, 10, and 14 meters (20, 33, and 46 feet) achieved yields similar to those observed at Majunga. Thus, it is evident that for future commercial utilization, tuna is available all year round in the offshore waters of Malagasy.

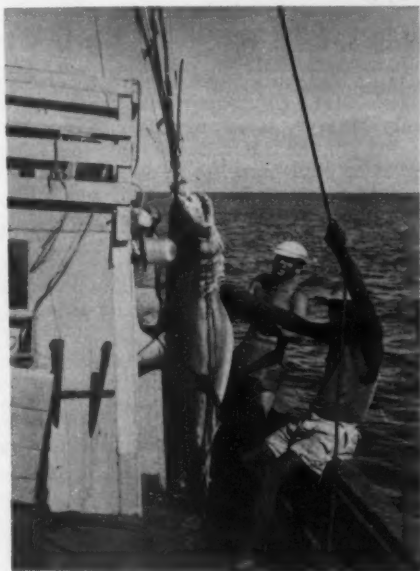


Fig. 4 - Mako shark (Isurus oxyrinchus) caught by the Maran Atha with long lines.

Following these studies, a small fishing enterprise at Nossi-Be started using a drifting long line for tuna fishing. The advantage of using a drifting line is that it is very simple and no special equipment is needed. The Malagasy and Comorian seamen aboard the Maran Atha had no trouble whatsoever with the long line. However, considering the short distances between fishing areas, fishing could be easily carried out with small boats since it would not be necessary to hold the catch aboard for more than 24 hours.

The studies off Majunga were expected to continue in order to verify the results obtained.

Malagasy Republic (Contd.):

If the results are conclusive, a fishery co-operative could be established as a pilot operation. A long line of 7.5 to 9.3 miles will be fished daily and the average daily catch is expected to be 1,100 pounds of tuna. The tuna would be canned and the sharks reduced to fish meal.

--A. Crosnier and P. Fourmanoir



Malaya

FIRM HOPES TO EXPORT CANNED TUNA TO UNITED STATES:

A joint Malayan-Japanese tuna canning firm established by Japan two years ago at Penang, Malaya, is reported to have informally sought the Japanese Fisheries Agency's approval to pack tuna in brine for export to the United States. The company presently packs only canned tuna in oil for export to Europe.

The Japan Export Canned Tuna Producers Association violently opposed the establishment of the Malayan company because it feared that the company would eventually begin to pack tuna for export to the United States. The Canned Tuna Association can be expected to oppose any such move on the part of the Malayan firm, which claims that the report is unfounded. (Suisan Tsushin, November 15, 1961.)



Mexico

FISHERY ADVISORY COMMISSION CREATED:

A fishery advisory commission was established in Mexico by Presidential Decree (*Diario Oficial*, December 16, 1961) and, according to press reports, Ex-President Abelardo Rodriguez has been appointed president of the commission.

The duties of the National Fishery Consultative Commission (Comision Nacional Consultiva de Pesca) are strictly advisory and all administrative actions pertaining to fisheries remain with the Ministry of Industry and Commerce.

The Commission consists of nine members: a president appointed by the President of Mexico, a Vice-President who shall be the Director of Fisheries, and one representative each from the Ministry of Marine, the Ministry of Treasury and Public Credit, the Ministry of Agriculture and Livestock, the National Bank for Cooperative Development, the National Company for Popular Subsistence, the National Storage Warehouses, and the Bank for Small Commerce.



This fresh-water fish farm, near Mexico City, is one of the numerous projects carried out by the Government to increase food production.

Although the Law of Ministries delegates to the Ministry of Industry and Commerce all matters pertaining to fisheries, during the course of time eight other government agencies have become involved in fisheries in one way or another. A representative of each of these agencies (with the exception of the Ministry of Hydraulic Resources which operates several fresh-water fish hatcheries) has been placed on the Commission. One of the principal functions of the Commission will be to coordinate the activity of the various agencies with respect to fisheries. The Commission will also advise on ways and means of increasing and improving the fisheries and fishing industry of Mexico. (United States Embassy, Mexico, December 20, 1961.)



Morocco

SARDINE PRODUCTION AND MARKETING:

Morocco's sardine canning season legally starts on June 1 and ends May 31.

Annual pack of 3½- to 4-ounce dingley-type flat cans, also known as quarter

Morocco (Contd.):

flats¹/, in 100-can cases fluctuated from 2,300,000 cases in 1956/57, to 1,800,000 cases in 1957/58, 1,300,000 cases in 1958/59, to 1,900,000 cases in 1959/60 and 2,350,000 cases in 1960/61.

The pack in 1960/61 consisted of all pilchards, packed principally in olive oil, peanut oil, soybean oil, and tomato sauce.

Out of total exports of 1,984,572 cases of pilchards in 1960/61, France received 691,500 cases, Germany 166,200 cases, Italy 124,000 cases, Ghana 106,700 cases, U.S.S.R. 78,600 cases, and Czechoslovakia 68,500 cases.

Morocco's pack June 1, 1961, to May 31, 1962, is expected to amount to 2,350,000 cases.

In Morocco there are 44 sardine-canning plants. The average wage paid to cannery workers is: women 15.5 U. S. cents per hour, men 17.5 cents per hour. Fishermen are paid about US\$77 a metric ton for the fish ex-vessel. The supply of raw fish available to the canners has been variable.

Prices to the canners are fixed by the export association and approved by the Government. Mandatory Government inspection as to quality of fish and pack is under the jurisdiction of the Office Cherifien d'Exportation, a Government agency. (United States Consulate, Casablanca, November 28, 1961.)

¹/The cans are about 4 inches long, 3 inches wide, and $\frac{3}{4}$ inch deep.

* * * * *

CANNED FISH EXPORT TRENDS:

During the first four months (June-September 1961) of the 1961/1962 packing season, exports of canned fish rose to 1,053,531 cases as compared to 829,265 cases the previous year. Exports by product were: sardines 823,393 cases, tuna 74,795 cases, others 150,343 cases.

Sharp competition has been encountered in foreign markets (except France with a duty-free contingent of 600,000 cases), particularly from Portugal which has lowered its prices. (United States Embassy, Rabat, November 30, 1961.)

New Zealand

FIRM HOPES TO CAN TUNA:

A New Zealand firm hopes to import Japanese frozen tuna and produce canned tuna, using Japanese canning techniques. The firm, located on Cook Island (west-southwest of Tahiti Island), wants to convert its fruit canning plant at Rarotonga Island (approximate location: 20° south latitude, 160° west longitude, south of Cook Island) for canning tuna. Japanese technicians would be invited to teach canning techniques to that company's cannery staff. For raw material, tuna loins would initially be imported from Japan, later whole frozen tuna.

The same company also plans to purchase fishing vessels to supply fish to its cannery. (Shin Suisan Shimbun Sokuho, November 18, 1961.)



Nigeria

JAPANESE PLAN TO ESTABLISH FISHING BASE HELD UP OVER FINANCIAL DIFFICULTIES:

The proposed establishment of a joint Nigerian-Japanese fishing base at Lagos, Nigeria, is reported to be running into financial difficulties. The two Japanese firms involved in the plan had hoped to finance the project with 500 million yen (US\$1.4 million), which they would borrow from the Overseas Economic Cooperative Fund, but their plan reportedly has bogged down due to the Cooperative Fund's reluctance to grant the necessary funds. One of the Japanese firms is a large fishing company and the other is a refrigeration equipment manufacturer.

The Overseas Economic Cooperative Fund as well as the Japanese Government are urging the two firms to increase their investments. However, the two firms, while admitting the commercial nature of their plan, feel that their venture would contribute to the promotion of the Japanese Government's policy of adjusting the present one-way export trade with Nigeria, normalize diplomatic relations with that country and, at the same time, would contribute to the development of Nigeria's fishery resources and fishery technology.

Meanwhile, a large United States fish-canning company is said to have indicated to the

Nigeria (Contd.):

Nigerian Government its desire to "concentrate its effort on fish processing if the Japanese have no intention of entering into this business." However, the Nigerian Government strongly favors conducting joint operations with the Japanese firms for two reasons: (1) to learn advanced Japanese fishing techniques so as to develop Nigeria's marine resources; (2) to reduce Nigerian imports from Japan.

A study made by the World Bank shows that Nigerian consumption of animal protein, is the lowest in the world. To supplement the deficiency of animal protein, Nigeria annually imports US\$28 million worth of dried fish from Norway. For Nigeria, the urgent task now is to acquire fishery techniques with which to develop her marine resources.

The plan to establish a joint fishing base in Nigeria rapidly gained momentum in July 1961 following an inspection tour of Nigeria by a group of Japanese Government officials, who opened negotiations with Nigerian Government leaders. In the course of negotiations, the fishing base plan proposed by the Japanese firms was brought up. The Nigerian Government responded enthusiastically to the plan and subsequently offered to advance 70 percent of the funds required to establish the joint company. Expecting the loan of \$1.4 million from the Overseas Cooperative Fund, the Japanese fishing company has already invested 100 million yen (US\$228,000) to equip fishing vessels and to furnish crews. However, the Japanese Finance Ministry, which approves all overseas investments, is now demanding that two firms either increase their investments or reduce the scope of their proposed fishing base in Nigeria. (Suisan Keizai Shimbun, December 8, 1961.)



Norway

TUNA FISHING INDUSTRY:

Before 1947, Norwegian fishermen caught some 200 metric tons of bluefin tuna every year with harpoons. In 1948 a few fishermen succeeded in catching tuna with purse seines. In 1949 landings increased to 2,500 tons, more than ten times as much as in the past. Encouraged by their success, a large number of vessel owners went in for purse-seine fishing for tuna which yielded 11,400 tons in 1952.

During four years, 1952-1955, Norway's tuna landings reached a peak of 8,000-10,000 tons per year. In 1956, however, the catch dropped to 4,500 tons. From that date up to 1960 it hovered around 3,000 tons. The number of purse seines fished during the peak year in 1955 was 433. Then the number started to decline gradually and in 1960 shrank one-fifth to 86. In 1960, the 86 purse seines yielded landings of 3,240 tons. Of the purse seines fished, 9 made no catch, 30 fished in the south of Stord and obtained average catches of 56 tons, valued at \$14,560, which was considered fair fishing.

The reason why landings drastically decreased in 1955 was that the fish schools stayed in offshore waters because of unfavorable weather conditions, instead of coming in to bays as they do during a year of abundant catches. Furthermore, tuna schools habitually move at the same speed as the bait fish they are chasing. They move fastest when they are not following their bait and fishing vessels have great difficulties in approaching the moving schools in offshore waters. The fishing season is from July-October. Especially toward the end of a season it is impossible for the fishing vessels to even approach the tuna schools close enough to fish. In the fall, the fish on which they feed become less and tuna go down deep into the water.

The Norwegian purse seine is 350 fathoms long with a mesh of 7.9 inches. A purse seiner has a deck of 60-70 feet and an auxiliary boat with a powerful engine. The seiner uses one other boat to handle the net. The crew of a vessel consists of 10-12 men. (Suisan Keizai Shimbun, November 24, 1961.)

WITHDRAWS FROM
WHALING CONVENTION:

The Norwegian Government on December 29, 1961, served notice of its conditional withdrawal from the International Whaling Convention. The United States Government, as the depository Government of the Convention, was notified accordingly.

The Government decided to withdraw because it had not been possible to ascertain whether the conditions for Norway's continued adherence to the Convention could be fulfilled. These conditions, formulated in September 1960, are: (1) that the Netherlands rejoin the Convention; (2) that the Soviet Union confirm its

Norway (Contd.):

acceptance of 20 percent of the total international whaling quota as its share; and (3) that, within a reasonable time, an agreement be reached on distribution of the remaining 80 percent between Norway, Great Britain, Japan, and the Netherlands. The withdrawal notice will be cancelled if and as soon as an agreement concerning distribution of the international whaling quota is signed by the five whaling nations prior to July 1, 1962.

The primary objective of the Norwegian Government is to attain an arrangement whereby the whale stock can be effectively protected against extinction, thus safeguarding the existence of a viable whaling industry. This could best be achieved by concluding a quota agreement based on recommendations of the whaling conference in London in 1958, while maintaining the Whaling Convention. Towards that end, Norway is prepared to participate in discussions when and where it might suit the other whaling nations, according to the January 11, 1962, issue of News

Denmark do, he said, the joint EEC trade tariff would cause great difficulties. West Germany and Be-Ne-Lux already have raised their tariffs on frozen fish fillets.

The danger facing Norway, he warned, is that the fishing industry in the Common Market, well protected behind high tariff barriers, will expand and make the EEC area far more self-sufficient with fish products. And there are no markets to take the place of the EEC area, he observed. (News of Norway, December 14, 1961.)



Peru

EXPORTS OF MARINE PRODUCTS, JANUARY-SEPTEMBER 1960-61:

Exports of principal marine products by Peru during the first nine months of 1961 were substantially greater than in the same period of 1960. Meal and oil exports were up considerably.

Peruvian Exports of Principal Marine Products									
Marine Products	July-Sept. 1961			Jan.-Sept. 1961			Jan.-Sept. 1960		
	Qty.		Value 1/	Qty.		Value 1/	Qty.		Value 1/
	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000
Fish meal	187,104	366.3	13,668	548,158	968.2	36,127	383,600	850.2	30,749
Fish (frozen, canned, etc.)	12,699	67.2	2,507	28,490	196.2	7,321	24,862	155.6	5,627
Fish oil	21,598	60.8	2,269	76,288	214.7	8,011	23,728	67.9	2,456
Sperm oil	3,851	13.7	511	6,435	24.1	899	9,489	32.4	1,172
Fertilizer (guano)	1,432	3.6	134	5,308	14.0	522	9,941	24.5	886
Whale meal	990	1.3	49	4,097	5.7	213	1,513	2.6	94
1/F. o. b. values converted at rate of 26.8 soles equal US\$1 for 1961 and 27.65 soles equal US\$1 for 1960.									

of Norway of the Norwegian information Service.

FISHERIES MINISTER'S VIEWS ON EEC:

In the opinion of Norway's Fisheries Minister, the fishing industry will likely be seriously affected whether or not Norway decides to join EEC--the European Economic Community. In view of this, he told the annual convention of the Sunnmøre Fishermen's Association, it is rather brash to oppose any link whatsoever with EEC.

The Minister observed that about 50 percent of the fish and fish products exported by Norway now goes to West Europe. If Norway fails to join EEC, while Great Britain and

CONTROL OF CANNED TUNA SALES TO EUROPE PROPOSED:

Peruvian canning industry representatives met with leading Japanese canned tuna exporters on November 24, 1961, in Tokyo to discuss means of regulating the sale of canned tuna and tuna-like fish in oil to Europe. The Peruvian representatives claimed that Japanese canned tuna in oil and Peruvian canned bonito were competing directly with each other for the European market, and that this price competition had driven down the prices for those products. Japanese exporters apparently have no intention of having the Japanese production of canned tuna for export to Europe, as well as sales, regulated at this time, as proposed by the Peruvian canners,

Peru (Contd.):

and this meeting is reported to have ended without definite agreement.

The Peruvian representatives later met with Japanese canned tuna packers from the Shizuoka area. They reportedly requested that Japanese canned tuna in oil, which is presently exported to Europe for around \$6.80 a case, be sold for \$7.00 a case f.o.b. Japan. Such a price hike is favored by some Japanese packers. However, it is unlikely that prices can be raised since the packers are not in a position to regulate export prices. (Suisan Tsushin, November 25 and December 6, 1961.)

**Poland****TRAWLERS FISHING OFF GUINEA:**

Two Polish lugger trawlers late in 1961 sailed for Guinea to operate with the Polish-Guinean fishing agency. It is anticipated that 10 additional vessels of this type will go to Guinea within a year.

In October 1960, an agreement was signed for the formation of a Polish-Guinean fishing company to begin operations in March 1961. Poland was to supply trawlers; the Guinean Government was to supply a base of operations, with a refrigeration plant, a fish meal plant, and warehouses. About 50 Guinean specialists and fishermen are to be trained in Poland. (The Fishing News, November 10, 1961.)

FISHING PLANS FOR 1962:

Some details of the plans for Polish commercial fishing in 1962 were revealed in a report about a session of the Sejm Committee on Maritime Economy and Navigation (Trybuna Ludu, December 7, 1961). The fish catch in 1962 is supposed to increase to 139,000 metric tons, six percent higher than in 1961. Since this increase is to be achieved by fishing in "distant waters," fishing enterprises are supposed to receive two more trawlers equipped for some processing. Out of the investments planned for the development of fishing next year, 44 percent reportedly have been allotted for the port of Szczecin.

As a part of the 1962 plans of the fishing industry, a "small" improvement is hoped for in the supply of fish for the domestic market. It was admitted, however, that present motorized refrigeration equipment was barely sufficient for supplying 6,000 tons of fresh sprats to the country's inland markets. To improve this situation, the addition of 16 additional mobile refrigerated units is planned during the current five-year plan.

**Portugal****RULES FOR ASSURING NORMAL SUPPLY OF GELLIDIUM TO AGAR-AGAR INDUSTRY:**

Rules designed to assure the Portuguese agar-agar industry a normal supply of gellidium seaweeds were established when the Secretary of State and Commerce issued Ministerial Order No. 18796 in the November 3, 1961, issue of Diario do Governo.

The Order makes it mandatory for gellidium pickers to register all the amounts gathered by them with the semi-official Regulatory Commission of Chemical and Pharmaceutical Products (Comissao Reguladora dos Produtos Quimicos e Farmaceuticos) and requires local exporters, when applying for an export license, to place at the disposal of the local agar-agar industry an unspecified percentage of their inventories in order to assure a year's supply of the qualities of gellidium deemed most appropriate to the industry. The legislative measure also classifies gellidium into three qualities, depending on the gelose content, moisture and impurities, and establishes the respective prices effective until July 1, 1962, at which exporters will have to offer these qualities of gellidium to the industry.

The amounts offered by exporters and not acquired by the industry 15 days after an offer is made, may be freely exported. (United States Embassy, November 21, 1961.)

**Rhodesia and Nyasaland Federation****LAKE KARIBA FISHING INDUSTRY:**

By 1964, a minimum annual production of 12,000 metric tons of fish are expected to be

Rhodesia and Nyasaland Federation (Contd.):

produced from Lake Kariba (the world's largest man-made lake) in Rhodesia. In 1960, about 1,000 tons of fish were taken. The total catch will reach 4,000 tons in 1961. Estimates for annual production in 1962 and 1963 are 8,000 tons and 9,000 tons, respectively.

To develop the fishing industry on the Lake, several concessions have been granted. Two concessions, for 10 years each, on the Southern Rhodesian shore will have an annual quota of 1,300 and 700 tons, respectively. A Northern Rhodesian concession, for five years, will have an annual quota of 1,000 metric tons. The remaining annual catch goals will be purchased by the concessionaires from independent fishermen. After two years the concessions will be reviewed, with the Government reserving the right to alter them to conserve and protect the resource.

Sites for cold-storage and ice-manufacturing plants will be made available for private enterprise under five-year concessions. Land will also be available for lease in Northern Rhodesia for fish canning and fish meal manufacture. Five harbors to shelter the fishing fleet are in the process of construction with completion scheduled in 1962.

Eighteen varieties of fish including bream, live in the lake; the bream were introduced. To develop this fishing industry, about 250,000 acres of land were cleared, and 80,000 acres are already submerged. A Fisheries Research Institute will be established at Lake Kariba in 1962. (United States Consulate, Salisbury, November 10, 1961.)



South Africa Republic

ONE SPINY LOBSTER AREA
DESTROYED BY VOLCANO:

The volcanic eruption late in 1961 resulting in the evacuation of the Island of Tristan Da Cunha in the South Atlantic Ocean also did considerable damage to the spiny lobster industry in that area. Canning and freezing facilities on the Island have been reportedly destroyed beyond repair.

At the start of these operations by five South African companies in 1949, the Coloni-

al Development Corporation invested about \$365,000 in the project. Exploration of the area's spiny lobster resources showed fishing grounds about 45 miles long by about 2 miles wide capable of sustaining an annual yield of over one million pounds. Almost the entire production was shipped to the United States.

It is believed that the operations will be rebuilt as soon as possible. (The Fishing News, December 8, 1961.)



South-West Africa

SOUTH-WEST AFRICA PILCHARD-
MAASBANKER FISHERY
ATTAINS 1961 QUOTA:

By the end of September 1961, the six pilchard processing factories in Walvis Bay, South-West Africa, had taken all but 23,295 tons of the 375,000 short tons of pilchards, maasbanker, and mackerel they were permitted to catch during the 1961 season. Three of the six factories had stopped production on reaching their individual quotas and the last of the remaining three factories were expected to close down early in November.

Walvis Bay has a quota 62,500 tons allocated to each of its six pilchard factories and the South-West Africa Administration imposes no closed season on fishing. It has been found, however, that the best fishing months--with the highest oil yield from prime fat fish--are in the middle of the year, and operations usually extend from March-April through September-October. Most of the catch is pilchards in South-West Africa.

This year, although the permitted total catch was raised from 310,000 tons in 1960 to what will most likely be a permanent 375,000 tons, canned fish packing has been limited to a total lower than the record 4,600,000 cases packed in 1960. An interesting development in 1961 has been a big increase in the pack of the one-pound oval pack to meet a growing demand. In one large factory the oval pack will make up 10,000 tons of the total canned fish pack of just under 25,000 tons. Canned fish was reported to be selling steadily, but the short pack period results in an accumulation of canned fish stocks for sale over the whole year.

South-West Africa (Contd.):

As the factories close, the plants are stripped down, and machinery, buildings, and boats (most of them privately-owned) receive a thorough overhaul in preparation for the 1962 season.

With the 542,429 short tons of pilchards, maasbanker, and mackerel caught off South Africa's Cape coast and the 351,705 tons taken off Walvis Bay, the South African and South-West African pelagic shoal catch to the end of September totaled 894,134 short tons. (October 1961 issue of The South African Shipping News and Fishing Industry Review.)



Spain

VIGO FISHERIES TRENDS, 1961

Fish Exchange: During October 1961, a total of 10,571 metric tons of fish valued at 72.2 pesetas (US\$1.2 million), passed through the Vigo Exchange. In November this amount decreased to 6,632 tons valued at 57.6 million pesetas (\$1.0 million) because sardine landings dropped from 5,097 tons in October to 2,152 tons in November. Other species which also decreased were anchovy and horse mackerel.

However, the amount of fish handled for the first 11 months of 1961 was 20.5 percent more than in the same period in 1960.

Year	Qty.	Value		Avg. Price (Ex-Vessel)	
	<u>Metric Tons</u>	<u>1,000 Pesetas</u>	<u>US\$ 1,000</u>	<u>Pesetas/ Kilo</u>	<u>US\$/ Lb.</u>
1961	71,972	683,553	11,393	9.49	7.2
1960	59,728	604,000	10,067	10.11	7.6

While statistics for December were unavailable, it was expected that the amount of fish handled was lower than for November. But the year's total was expected to surpass totals for the last 30 years. Sardine and horse mackerel landings particularly contributed to this higher 1961 volume.

The first fish-freezing vessel of the Vigo fleet, the *Lemos*, came into port in early December with a cargo of 240 tons of hake and small hake (pescadilla), the result of a three months' trip in South American waters. The result in the market was not so promising, however, partly because of inadequate distribution facilities, and partly because the local conservative public, accustomed to fresh fish, looked askance at the frozen variety. Prices for the frozen hake dropped from 28 to 25 pesetas per kilo (21.2 to 18.9 U.S. cents a pound) ex-vessel despite the fact that fresh hake sold during the previous three months at an average price of 43 pesetas per kilo (32.5 cents a pound). The frozen fish has been stored until it seems opportune to make another attempt to sell it.

The *Andrade*, sistership of the *Lemos*, as of December 1961 was fishing in South African waters. The firm owning the vessels plans to acquire a transport vessel to permit a longer period of time for fishing. It also plans to build other vessels of the same type.

Canning: The activity of the fish canning industry decreased somewhat at the end of November owing to the smaller catches of sardine and greatly reduced landings of tuna (bonito). The lack of sardines in a period when canners were counting on a continued abundance took many canners, with foreign orders pending, by surprise. The decrease in catches (about 50 percent) contributed to the increase in sardine ex-vessel prices at the Vigo Exchange from 3.74 pesetas (2.8 cents a pound) in October to 5.08 pesetas (3.8 cents a pound) in November and presented a problem to packers who quoted canned sardines at competitive prices in the international market. During December, some canners found themselves obliged to buy sardines at any price in order to fill their commitments, and to avoid a total loss of their export market.

Even without considering it an outstanding year for exports, it is believed that 1961 will not fall behind 1960, but considerably under the hopes and plans of exporters who have, despite all, done quite well in the foreign market. The Government measure to grant a fiscal tax deduction for exports has favored sales abroad.

Canners are urging the Government to permit the free import of frozen tuna for canning; at present the duty is 19 percent ad valorem. On obtaining such authorization, it is planned to set up a regular flow of raw fish which will permit canneries to plan their production and sales for several months ahead, without being subject to the hazards impinging on the short and uncertain tuna season in Spain. As a rule, the season lasts from June to October-November, and only a very small number of canners have refrigeration facilities to store a certain amount of fish to provide work in periods of scarcity of fresh fish.

There is talk also of the possible formation of an association of canners to expand the export of canned albacore to the United States. Basically, 65 firms of the Northwest and Cantabrian region of Spain (43 in Galicia) have joined the plan. For the present, it would be limited to albacore and to the United States market, but it is expected to be the base for future associations which would apply to other species and other markets, if the plan works out.

The order (*Boletín Oficial* of August 26, 1961) which regulates the inspection of Spanish canned fish should have entered in force early in 1962, but it has been postponed for another year in some of its applications. At present there are no means for carrying out this inspection; moreover, the prime objective would be the standardizing of cans which would facilitate the control, and it is this aspect which will not go into effect until 1963. Plans and production methods, machinery, and even outmoded cans do not permit the immediate implementation of the law without hurting the canners. These maintain that control is already carried out by the importing countries, the majority of which have very strict rulings for the admission of food. (United States Consulate, Vigo, January 5, 1962.)

Note: Values converted at rate of 60 pesetas equal US\$1.



Sweden

SWEDEN REFUSES TO ISSUE FLOATING TRAWL PATENT TO DANE:

The long dispute over a Swedish patent on a Danish floating trawl was ended on October 13, 1961, when Swedish authorities dismissed the appeal of Robert Larsen of Skagen, Denmark, from a 1959 decision which refused him a patent for the reason that a patent had been issued four years earlier for a floating

Sweden (Contd.):

trawl of the same type to Aron and Yngve Bernhardsson of Foto, Sweden.

According to reports in Danish and Swedish fishery trade publications (Dansk Fiskeritidende, November 17, 1961; Vestjysk Fiskeritidende, November 10, 1961), Larsen had contended that his trawl was different because it was regulated by the length of the cables and the speed of the vessel whereas the Swedish trawl was regulated by means of floats. However, the Swedes were able to demonstrate that the two trawls operated on precisely the same principles, thus relieving many users of the Swedish trawl from possible economic claims by Larsen. (Report of December 13, 1961, from Fisheries Attache, United States Embassy, Copenhagen.)



Taiwan

JOINT AFRICA-TAIWAN
FISHING OPERATIONS:

Fishery cooperation agreements have been made by Taiwan with Malagasy and Liberia. The government-owned China Fisheries Corporation (CFC) is to send experienced fishermen to those countries to provide technical assistance to the local fishing industry. The CFC will also provide tuna to a cannery in Malagasy.

Under discussion is a joint fishing enterprise with Liberia whereby that country would provide shore facilities and the CFC would furnish capital investment in the form of fishing vessels. Also under consideration is an agreement with Sierra Leone for the use of port facilities. (United States Embassy, Taipei, November 7, 1961.)



U.S.S.R.

NEW FREEZER FISHING VESSEL:

The freezer vessel Bratsk was constructed for the Soviet fishing fleet by the East Germans in the city of Stralsund. The 2,495-gross-ton ship will carry a crew of 91, cruise at 11 knots, and carry enough fuel to remain at sea for 40 days. Its 2nd ammonia

refrigeration units can freeze 50 tons of fish every 24 hours and maintain the total hold capacity of 800 tons at minus 18° C. (-0.4° F.). The Bratsk will be incorporated into the Kaliningrad fishing fleet. From Rybnoe Khoziaistvo (Fishing Industry), No. 8, August 1961.

NEW TYPE FACTORYSHIP FOR
WHALING AND FISHING:

A whaling mothership (17,000 gross registered tons) valued at approximately DM65 million (\$16.3 million) was launched at the end of November 1961 by the Government-owned shipyard of Kiel, which constructed the ship under a U.S.S.R. order placed in the middle of 1960. In the course of the ceremonies, the wife of the Soviet Ambassador to Bonn named the ship Vladivostok.

The ship represents a new type in the field of whaling and deep-sea fishing and was constructed according to plans based upon the findings of Soviet scientific research. It will serve as whaling mothership and also as a fish cannery. She is equipped with a landing deck for a helicopter which can be used to locate the whales and fish for the smaller boats.

This is the first of two ships of this type and size ordered by the U.S.S.R. in June 1960 for delivery in 1962. A second vessel will be delivered in 1962.

The Japanese were the first to develop a factoryship capable of performing the dual functions of whaling and fishing. The Vladivostok can also produce frozen fish, fish-liver paste, and vitamin-rich fish oils. The vessel has a speed of 14 knots and will be manned by a crew of 408 men. (Le Marin, December 8, 1961; United States Consulate, Bonn, December 15, 1961.)

PROGRESS IN FROZEN
FISH PRODUCTION:

In June 1961, the Central Committee of the Communist Party noted the importance of the use of freezing (especially blast-freezing) in the production, storing, and transportation of fish products. U.S.S.R. production of frozen fish products increased from 442,400 metric tons in 1950 to 674,000 tons in 1960; production of salted fish products has declined.

U. S. S. R. (Contd.):

In 1958, about 31 percent of the fishing fleet was equipped with refrigerated holds, and by 1960 this was increased to 44 percent. The quality of refrigeration has been improved by (1) lowering hold temperatures from 10.4°-14° F. to minus 0.4°-13° F., (2) equipping factoryships with efficient air apparatus for blast freezing, and (3) providing generators to produce ice from sea water. In 1965, according to the Seven Year Plan, 1,230,000 metric tons of fish will be blast-frozen, compared to 540,000 tons in 1960. From Rybnoe Khoziaistvo (Fishing Industry), No. 8, August 1961; FAO Yearbook of Fishery Statistics, 1960.

SALMON CULTURE SUCCESSFUL:

The Soviets have made significant advances in the culture of chum salmon. The Steplovskii Fish Culture Station of the Amur River Basin in the Far East has substantially increased autumn chum runs from 2,000 to 6,000 spawners before 1928 to 60,000 spawners in 1960.

Marking experiments showed that survival of cultured fish, as indicated by adult returns, was 1 percent as compared to a natural survival of 0.1 percent.

Similarly, two fish-culture stations, established along the Takoe River on Sakhalin Island, have increased annual chum runs from 400 to 40,000 spawners over a 30-year span. Success is believed due to the release of chum salmon one month to two years old. The Soviets stated that significant numbers of artificially-reared chum probably are taken in high-seas catches, particularly by the Japanese. From Rybnoe Khoziaistvo (Fishing Industry), No. 4, April 1961.

FISHERY LANDINGS INCREASED IN 1960:

The U. S. S. R. continued its rapid strides in fishery expansion with a 1960 catch of 3,051,000 metric tons of fishery products and about 450,000 tons of whales. In world fishery production, the U. S. S. R. now ranks ahead of the United States, following only Japan, Communist China, and Peru. The Soviet catch has doubled since 1950, mainly because of the addition of many high-seas fishing vessels to its fleet. In 1960, about 78 percent of the U. S. S. R. catch was taken by high-seas vessels, compared with only 34 percent in 1950. A total catch of 4,620,000 tons is planned for 1965.

The Soviet Union's 1960 catch exceeded all expectations. Almost 2,000,000 tons of it found its way to the Soviet consumer's table.



Fig. 1 - Typical Russian trawler fishing in North Pacific and Bering Sea.

U. S. S. R. (Contd.):

U.S.S.R. Fishery Landings by Principal Species, 1959-60		
Species	1960	1959
. (1,000 Metric Tons) .		
Herring and related species:		
Atlantic herring	523.4	464.3
Pacific herring	193.0	235.3
Other	367.1	356.7
Total	1,083.5	1,056.3
Cod and related species:		
North Atlantic species	439.8	293.7
Alaska pollock	109.2	51.6
Pacific species	32.1	28.9
Baltic cod	91.4	40.5
Total	672.5	414.7
Flounder and related species:		
Pacific Ocean species	219.0	191.2
Other	22.7	12.6
Total	241.7	203.8
Other species:		
Salmon and related species ...	120.5	142.2
Ocean perch or redfish	183.9	243.5
Other marine fish	247.9	183.8
King crab and other shellfish ..	37.4	32.8
Marine animals and residue ..	32.0	13.5
Total marine production ...	2,619.4	2,290.6
Fresh-water fish	431.6	465.4
Grand total	3,051.0	2,756.0

Sources: Food and Agriculture Organization Yearbook of Fishery Statistics, 1960; Ryboos Khodiatvo (Fishing Industry), No. 5, May 1961; and Australian Fisheries Newsletter, November 1961.

With the exception of the Far East deep-sea fleet, all branches of the industry over-fulfilled their plan. The Black Sea deep-sea fleet's sardine operations off West Africa

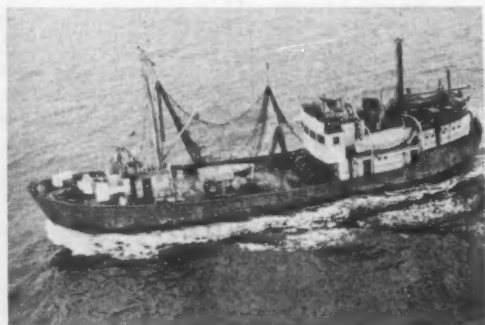


Fig. 2 - Another Russian trawler with nets spread out to dry. Vessel is underway.

were highly successful, and the cod and herring fisheries did extremely well.

The stern-fishing factory-trawler has become the standard deep-sea vessel and the basic design has now been attained in the Leskov class being built in Poland. The dimensions of this latest trawler are: Overall length, 279 ft. 6 in.; between perpendiculars, 246 ft; beam, 45 ft. 4 in.; depth, 23 ft.; draught, 17 ft. 6 in.; displacement, 2,298 tons; dead-weight, 1,240 tons; speed, 12.5 knots.



Fig. 3 - Russian fishery factoryship (length about 150 feet) operating in Bering Sea.

The main improvements over the earlier Pushkin class are a decrease of 8 inches in the freeboard, reducing the wind area and consequential drift when trawling, and a lengthening by 6 ft. of the trawl deck to 66 ft., thus enabling the entire trawl to be hauled on deck in one operation.

There is also an impressive increase in fish hold space over the Maiakovski class. This has been obtained by reducing the fuel capacity to 500 tons and by using a less bulky main engine. It appears that the Maiakovskis were returning home with 150 tons of Diesel fuel and 60 tons of boiler oil still in their tanks.

NORTHWEST ATLANTIC FISHERIES, 1956-60:

The U.S.S.R. began fishing in Northwest Atlantic waters in 1956 after conducting exploratory cruises in 1955. According to the International Commission for the Northwest Atlantic Fisheries (ICNAF), the Soviets have reported annual catches that have rapidly increased from 17,000 metric tons in 1956 to over 258,000 tons in 1960.

Table 1 - U.S.S.R. Catch in ICNAF Convention Area, 1956-1960					
Species	1960	1959	1958	1957	1956
..... (Metric Tons)					
Cod	130,612	15,453	5,826	18,041	3,001
Haddock	104,147	155,004	108,900	46,805	12,908
Ocean perch	237	224	89	212	104
Halibut	4,392	678	267	819	12
Flounder	9,686	10,578	1,674	1,458	984
Others					
Total	258,074	181,937	116,756	69,335	17,009

U. S. S. R. (Contd.):

In a period of four years, the U.S.S.R. fisheries have expanded to account for about 12 percent of the over two million tons of fish taken annually in the Convention Area and to lead the other member nations in the ocean perch catch. Fishing for ocean perch, cod, and haddock has been conducted on the banks off Newfoundland and Labrador. In 1961, Soviet fishing fleets moved southward to Georges Bank off the United States coast.



Large Soviet stern trawler (Maiakovski class) fishing in North Atlantic on the "northern edge" of Georges Bank in October 1961. Trawler's home port is Klaipeda.

The Soviet fishing fleet operating in the Convention Area during 1959 consisted of 111 vessels with a total tonnage of 126,596 tons. Operations have been characterized by the use of large stern factory-trawlers as well as conventional trawlers; the larger types have refrigerated holds.

Table 2 - U.S.S.R. Trawler Fleet Fishing in ICNAF Convention Area, 1959

Tonnage Class	No. of Vessels	Total Tonnage	Average Tonnage
151-500	39	10,296	264
501-900	31	19,500	630
901-1,800	6	7,200	1,200
Over 1,800	35	89,600	2,560
Totals	111	126,596	1,141

Home ports reported for the Soviet vessels were Murmansk on the Barents Sea, and Kaliningrad, Klaipeda, and Riga on the Baltic Sea. (International Commission for the Northwest Atlantic Fisheries, *Statistical Bulletins*, vol. 7-8; 1959 and 1960.)



United Kingdom

AID FOR FISHING INDUSTRY:

In seven years (1954 through March 31, 1961) Britain's White Fish Authority has financially assisted the industry to the extent of £39,984,137 (almost US\$112 million) in loans and grants.

Loans totaled £28,228,884 or \$79 million (£23,424,516 or \$65.6 million for the near-middle water fleet and £4,804,368 or \$13.4 million for the inshore industry) and grants amounted to £11,755,253 or \$32.9 million (£9,334,200 or \$26.1 million and £2,421,053 or \$6.8 million, respectively). All loans and grants were for vessels, except £566,399 or \$1.6 million for inshore engines.

In addition to this financial aid, the British Government also assists the industry through the white fish and herring industry subsidies. These were extended in 1961 to compensate for the loss of traditional British fishing grounds.

It is estimated that the white fish subsidy will cost £1,497,064 (\$4.2 million) for the near-middle water fleet and £591,826 (\$1.7 million) for the inshore industry, but distant-water trawlers also will be subsidized at the rate of £17 (\$47.60) for every day at sea. The daily rate for near-middle water vessels will vary, depending on vessel size, except in the case of coal burners which will be paid £10 (\$28.00) a day at sea. The inshore subsidy is paid on landings and has been raised by 4d. per stone (31 U.S. cents a hundredweight) to 1s. 2d. a stone (\$1.16 a hundredweight) for gutted and 1s. a stone (\$1.00 a hundredweight) for round fish. The new white fish subsidies came into force on August 1, 1961.

The herring industry subsidy (as from September 1) ranges from 3½ d. per stone (27.5 U.S. cents a hundredweight) to £12-£14 (\$33.60-\$39.20) a day at sea. The Herring Industry Board will also continue to pay a subsidy to maintain prices for surplus herring used for meal and oil production.

Loss of British fishing grounds will follow Britain's agreements with Norway and Iceland over their unilateral claim to a 12-mile territorial sea. Until October 31, 1970, British vessels will be able to continue to fish in a zone between 6 and 12 miles off the Norwegian coast. After that date they will have to stay outside 12 miles.

The agreement with Iceland provides that until March 1964, British vessels will continue to fish at certain seasons and in certain areas in a 6-12 mile zone around Iceland.

Following Britain's agreements with Norway and Iceland, the Soviet Union gave notice to terminate an agreement which has enabled British vessels to fish in certain Russian northwest waters within 12 miles of the coast. The Soviet Union also has claimed a 12-mile limit.

Speaking in the House of Commons debate when the new subsidies were approved, the Minister for Agriculture and Fisheries said that Britain's agreements with Iceland and Norway were expected to result in a drop of 25 percent in the total British distant-water catch. This would be equivalent to a loss of £5½ million (\$15.4 million) and he doubted whether the vessels fishing elsewhere could make up more than two-thirds of it. That would mean a net loss of about £2 million (\$5.6 million) and the Government had decided to make up £1,250,000 (\$3.5 million) of it. That worked out at £17 (\$47.60) a vessel a day, or £5,500 (\$15,400) a year towards the estimated loss of £5,000 (\$22,400).

The above data on White Fish Authority loans and grants are from the Authority's annual report to March 31, 1961. The term "white fish" excludes pelagic fish and shellfish.

White fish landings in the United Kingdom in the calendar year 1960 totaled 805,028 metric tons, worth £60,686,102 (\$169.9 million). Landings by British vessels totaled 693,239 tons and by foreign vessels (fishing and other) 111,789 tons. Of the British vessel landings, half was taken by the distant-water fleet, one-third by the near-middle water fleet, and the remainder by the inshore industry.

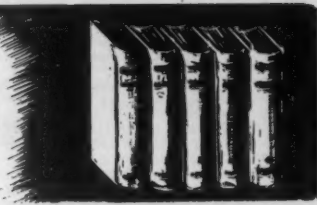
Distant-water vessels dropped in number by 10 to 229 and near-middle water vessels by 26 to 502.

The White Fish Authority's income for the year totaled £325,309 or \$910,900 (£235,840 or \$660,300 from general levy) and expenditures £310,272 (\$868,800), leaving a surplus of £15,037 (\$42,100). Expenditures comprised mainly general administration £137,185 (\$384,100), publicity £74,882 (\$209,700), fishermen's training courses £31,184 (\$87,300), research and experiments £29,609 (\$82,900). (*Fisheries Newsletter*, November 1961.)





FEDERAL ACTIONS



Department of the Interior

AMERICAN FISHERIES ADVISORY COMMITTEE--OBJECTIVES, RESPONSIBILITIES, AND AUTHORITY:

The objectives, responsibilities, and authority of the American Fisheries Advisory

Committee as defined in a Department of the Interior directive were published in the January 5, 1962, Federal Register. Appointed by the Secretary of the Interior, the Committee is authorized by the Saltonstall-Kennedy Act of July 1, 1954 (68 Stat. 376; 15 U.S.C. 713c-3), as amended.

Office of the Secretary COMMITTEE MANAGEMENT American Fisheries Advisory Committee

The following material is a portion of the Departmental Manual and the numbering system is that of the Manual.

PART 630—AMERICAN FISHERIES ADVISORY COMMITTEE

CHAPTER 1—OBJECTIVES, RESPONSIBILITIES, AUTHORITY

1. *Objectives.* The objective of the American Fisheries Advisory Committee is to consider and give advice and make recommendations on the matters relating to the commercial fisheries programs in the Department of the Interior. The Committee shall strive toward the furtherance of coordination in research programs, and the promotion of better relations within the fishing industry and the public.

2. *Responsibilities.* The Committee shall be responsible to the Secretary of the Interior and shall submit to him its advice and recommendations on fishery matters in regard to the formulation of policy, rules, and regulations pertaining to requests for assistance and other matters as deemed appropriate by the Chairman of the Committee for consideration by the Committee. The American Fisheries Advisory Committee shall:

A. Consider the problems of producers, processors, distributors, and consumers;

B. Review the current research and other programs of the Bureau of Commercial Fisheries and recommend adjustments, terminations, and expansions, in order that available funds will be used on problems of greatest importance;

C. Recommend new work or the expansion of current programs and advise with respect to the relative priorities to be given various programs;

D. Consider future needs arising from long-term trends in world fisheries and international use of high-seas resources, plus the changes in the needs of the United States industry.

3. *Authority.* The Secretary of the Interior is authorized " . . . to appoint an advisory committee of the American fishing industry . . . " under the provisions of the Saltonstall-Kennedy Act of

July 1, 1954 (68 Stat. 376; 15 U.S.C. 713c-3), as amended. The Committee is authorized by the same act to advise the Secretary of the Interior in the formulation of policy, rules, and regulations pertaining to requests for assistance from the commercial fishing industry and other matters.

A. Definitions.

A. *Chairman.* The Chairman of the American Fisheries Advisory Committee shall be the Assistant Secretary for Fish and Wildlife, Department of the Interior.

B. *Executive Secretary.* The Executive Secretary shall be a full-time, salaried, career Federal Civil Service employee to be designated by Director, Bureau of Commercial Fisheries.

C. *Industry representative.* Industry representatives shall also be referred to as "Committee members" and are appointed by the Secretary of the Interior, under the authority vested in him under the Saltonstall-Kennedy Act of July 1, 1954, as amended, and under the provisions of Chapter 2 of this Part.

CHAPTER 2—POLICIES AND PROCEDURES

1. *Composition of committee.* The American Fisheries Advisory Committee shall consist of not more than 20 members and not less than 12 members, of which 50 percent shall constitute a quorum at any meeting for the conduct of Committee business.

2. *Qualifications for membership.* Persons appointed to the American Fisheries Advisory Committee shall be individuals actively engaged in the commercial fishing industry of the United States of America and, to the extent that it is possible, should represent the following industry segments:

A. Commercial fishery producers, processors, and distributors;

B. Representatives of fishermen's co-operatives, including fishermen actively engaged in a commercial fishery;

C. Officials or executives of trade associations and labor unions, provided they spend a principal portion of their working time in the operation of a business which is a constituent unit of the commercial fishing industry, and if his position as a trade association official or executive is incidental to that activity. No person appointed to membership on the American Fisheries Advisory Com-

mittee shall be considered as representing a trade association or labor union.

3. *Terms of appointment for industry representatives.*

A. *Appointment period.* The term of office for Committee members is 3 years, with approximately one-third of the membership of the Committee changing each year. All terms of office shall terminate on the 30th of June in the calendar year designated by the Secretary of the Interior in his letter of appointment.

B. *Reappointment to committee.* Upon completion of one 3-year term of office or portion thereof, a Committee member shall be eligible, at the discretion of the Secretary of the Interior, for appointment to an additional term of office of 3 years. No Committee member may serve more than 6 consecutive years.

C. *Vacancies on the committee.* Vacancies shall be filled for the unexpired terms of Committee members in accordance with Chapter 2.2 of this Part.

(1) A replacement appointee shall be eligible, at the discretion of the Secretary of the Interior, for appointment for one additional 3-year term.

4. *Alternates.* No Committee member may be represented by an alternate.

5. *Allowances for committee members.* Members shall receive no compensation unless authorized by the Secretary of the Interior, subject to the provisions of Section 15 of the Act of August 2, 1946 (60 Stat. 810; 5 U.S.C. 55a). Committee members shall be reimbursed for travel expenses to and from Committee meetings at standard government rates.

6. Committee meetings.

A. *Number of meetings.* The American Fisheries Advisory Committee shall meet at least once each year.

B. *Place of meetings.* The time and place of all meetings of the Committee shall be determined by the Chairman of the Committee.

C. *Agenda.* The agenda of meetings held by the Committee shall be initiated within the Department of the Interior by the Bureau of Commercial Fisheries, and shall be approved by the Chairman of the Committee. Upon approval of the Chairman, the agenda shall become available to the members of the Committee prior to the meeting.

D. *Minutes of meetings.* The Executive Secretary shall be responsible for

preparation of summary minutes of all meetings held by the Committee.

7 Information. Requests for information concerning the activities and functions of the American Fisheries Advisory Committee should be addressed to the Director, Bureau of Commercial Fisheries, Department of the Interior, Washington 25, D.C.

JAMES K. CARR,
Under Secretary of the Interior.

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FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

FEDERAL STANDARD FOR GRADES OF FROZEN FRIED BREADED SCALLOPS:

A voluntary standard for grades of frozen fried breaded scallops was announced in the December 14, 1961, Federal Register. The standard is the first issued by the Department of the Interior prescribing Government standards for frozen fried scallops and became effective on January 14, 1962.

The standard points out that frozen fried scallops are prepared from the whole or cut adductor muscles of the sea scallop (Placopecten magellanicus), or scallop units cut from a block of frozen sea scallops, that are coated with wholesome batter and breading and precooked in oil or fat, and then packaged and frozen. They contain a minimum of 60 percent by weight of scallop meats.

Three grades have been set up for frozen fried breaded scallops: (1) "U. S. Grade A" possess good flavor and odor and a total score for factors of quality of not less than 85 points; (2) "U. S. Grade B" possess at least reasonably good flavor and odor, and a score of not less than 70 points; (3) "Sub-standard" fail to meet the requirements of U. S. Grade B.

As published, the standard describes the product, styles of pack, grades, factors of quality (ascertaining the grade; evaluating the unscored factor of flavor and odor; evaluating and rating the scored factors of appearance, uniformity, absence of defects and character; appearance; uniformity; absence of defects; and character); definitions and methods of analysis; and lot certification tolerances.

Notice of intention to establish scallop standards was published in the July 20, 1961, Federal Register. Interested persons had until August 19, 1961, to submit written comments, suggestions, or objections regarding the proposal. One objection was received and was considered by the Fish and Wildlife Service.

Standards have already been established for frozen fish blocks, frozen fried fish sticks, frozen raw breaded fish portions, frozen cod fillets, frozen haddock fillets, frozen ocean perch fillets, frozen halibut steaks, frozen salmon steaks, frozen raw breaded shrimp, and frozen raw headless shrimp. These standards were developed by the Bureau of Commercial Fisheries, Fish and Wildlife Service, in cooperation with the fishing industry.

In addition to the standards program, the Department conducts a continuous inspection service in which 40 processors producing 170 million pounds of fishery products annually participate. Participation is voluntary. Processors who come under the inspection service and produce fishery products in accordance therewith may display the Department of the Interior "shield of quality" on the packages containing those products. The Department also conducts a program under which fishery products are inspected by lot and the product is certified, attesting to its quality and condition.

The standard as published in the Federal Register follows:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER C—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 270—UNITED STATES STANDARDS FOR GRADES OF FROZEN FRIED SCALLOPS

On page 6518 of the FEDERAL REGISTER of July 20, 1961, there was published a notice and text of a proposed new part 270 of Title 50, Code of Federal Regulations. The purpose of the new part is to issue United States Standards for Grades of Frozen Fried Scallops under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e).

Interested persons were given until August 19, 1961, to submit written comments, suggestions or objections with respect to the proposed new part. One objection was received and considered and the proposed new part is hereby adopted without change and is set forth below. This part shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: December 8, 1961.

JAMES K. CARR,
Acting Secretary of the Interior.

PART 270—UNITED STATES STANDARDS FOR GRADES OF FROZEN FRIED SCALLOPS¹

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270.14 Appearance.
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DEFINITIONS AND METHODS OF ANALYSIS

- 270.21 Definitions and methods of analysis.
270.25 Tolerances for certification of officially drawn samples.

AUTHORITY: §§ 270.1 to 270.21 issued under 16 U.S.C. 743e.

PRODUCT DESCRIPTION AND GRADES

§ 270.1 Product description.

Frozen fried scallops are prepared from wholesome, clean, adequately drained, whole or cut adductor muscles of the sea scallop (*Placopecten magellanicus*), or scallop units cut from a block of frozen sea scallops, that are coated with wholesome batter and breading and pre-cooked in oil or fat. They are packaged and frozen according to good commercial practice and are maintained at temperatures necessary for preservation. Frozen fried scallops contain a minimum of 60 percent by weight of scallop meat.

§ 270.2 Styles of frozen fried scallops.

The styles of frozen fried scallops include:

(a) *Style I Ranaom pack.* Scallops in a package are reasonably uniform in weight and/or shape. The weight or shape of individual scallops are not specified.

(b) *Style II Uniform pack.* Scallops in a package consist of uniform shaped pieces which are of specified weight or range of weights.

§ 270.3 Grades of frozen fried scallops.

(a) "U.S. Grade A" is the quality of frozen fried scallops that possess good flavor and odor; and for those factors of quality which are rated according to the scoring system outlined in this part, the total score is not less than 85 points.

(b) "U.S. Grade B" is the quality of frozen fried scallops that possess at least reasonably good flavor and odor; and for those factors of quality which are rated according to the scoring system outlined in this part, the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen fried scallops that fail to meet the requirements of U.S. Grade B.

FACTORS OF QUALITY

§ 270.11 Ascertaining the grade.

The grade of frozen fried scallops is determined by examining the product in

the frozen and cooked states. Factors of quality evaluated in ascertaining the grade of the product are flavor and odor, appearance, uniformity, absence of defects, and character.

(a) Flavor and odor are rated directly by organoleptic evaluation.

Score points are not assessed (see § 270.12).

(b) Appearance, uniformity, absence of defects, and character are rated numerically on a scale of 100. The maximum number of points that may be given each of these factors are:

Factors:	Points
Appearance	25
Uniformity	20
Absence of defects	40
Character	15
Total possible score	100

¹ Frozen fried scallops which receive the maximum number of deduction points for any of these factors shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

§ 270.12 Evaluating the unsecured factor of flavor and odor.

(a) "Good flavor and odor" (essential requirements for a Grade A product) means that the cooked product has flavor and odor characteristics of good scallop meat and of the breading and is free from staleness and off-flavors and off-odors of any kind.

(b) "Reasonably good flavor and odor" (minimum requirements of a Grade B product) means that the cooked product is lacking in good flavor and odor, but is free from objectionable off-flavors and off-odors of any kind.

(c) "Substandard flavor and odor" (Substandard grade) means that the flavor and odor fails to meet the minimum requirements of "reasonably good flavor and odor."

§ 270.13 Evaluating and rating the scored factors of appearance, uniformity, absence of defects, and character.

Point deductions are allotted for each degree or amount of quality variation within each of the factors that are scored. The net score for each quality factor is obtained by subtracting the deduction-points assessed for that factor from the maximum points allotted to that factor. The total score for the product is the sum of the net scores for the four individually scored factors.

§ 270.14 Appearance.

(a) Appearance refers to the condition of the package and ease of separation in the frozen state and continuity and color in the cooked state.

(1) "Condition of the package" refers to freedom from packaging defects and the presence in the package of oil, and/or loose breading, and/or frost. Deduction points are based on the degree of the improper condition as small or large.

(2) "Ease of separation" refers to the difficulty of separating scallops that are frozen together after the frying operation and during freezing.

(3) "Continuity" refers to the completeness of the coating of the product in the cooked state. Lack of continuity is exemplified by breaks, ridges and/or lumps of breading. Each $\frac{1}{8}$ square inch area of any break, ridge, or lump of breading is considered an instance of lack of continuity. Individual breaks, ridges, or lumps of breading measuring less than $\frac{1}{8}$ square inch are not considered objectionable. Deduction points are based on the percentage of the scallops within the package that contain small and/or large instances of lack of continuity.

TABLE I—SCHEDULE OF POINT-DEDUCTIONS FOR VARIATIONS IN APPEARANCE

Appearance subfactors	Method of determining subfactor scores	Percent of scallops affected		Deduction points
		Over	Not over	
Condition of the package in the frozen state.	Degree of condition of the package			
	(a) Small (moderate amount of free oil, and/or loose breading, and/or frost, and/or packaging defects).			2
	(b) Large (excessive amount of free oil, and/or loose breading, and/or frost, and/or packaging defects).			5
Ease of separation of the scallops in frozen state.	Degree of ease of separation			
	Moderate (scallops separated by hand with difficulty).	0-20	30-70	1
		20-70	70	2
	Severe (scallops separated only by use of knife or other instrument).	0-30	30-70	3
		30-70	70	15
Continuity of the scallops in the cooked state.	Lack of continuity (breaks, ridges, and lumps). ¹	0-20	20-30	3
		20-70	30-70	4
	Small (1 to 3 instances per scallop).....	0-20	20-30	4
	Large (over 3 instances per scallop).....	20-30	30-70	8
		30-70	70	12
		70		25
Color of the scallops in the cooked state.	Deviation from predominating color of fried scallops in cooked state			
	Small instance of deviation in color means that the scallop varies noticeably from the predominating color of the package after cooking.	0-10	10-30	0
		10-30	30-70	2
	Large instance of deviation in color means that the scallop varies markedly from the predominating color of the package after cooking.	0-10	10-30	4
		10-30	30-70	6
		30		10
				25

¹ Each $\frac{1}{8}$ square inch is considered an instance.

¹ Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

(4) "Color" refers to reasonably uniform color which is characteristic of the product in the cooked state.

Deviations in color are visually measured as "small" and "large". A "small" instance of deviation in color means that the scallop varies noticeably from the predominating color of the package. A "large" instance of deviation in color means that the scallop varies markedly from the predominating color of the package. The deduction points assessed are based on the degree of deviation as small or large and the percentage by count of the scallops affected in the package.

(b) For the purpose of rating the factor of appearance, the schedule of deduction points in Table I applies. Frozen fried scallops which receive 25 deduction points for the factor of appearance shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

§ 270.15 Uniformity.

(a) Uniformity refers to the degree of freedom from undesirable small pieces and to the degree of uniformity of the weights of the frozen fried scallops within the package.

(1) For Style I, deduction points are assessed for (i) undesirable small pieces as determined by the percent by count of pieces passing through a sieve with $\frac{3}{4}$ inch openings, and (ii) uniformity of size of the scallops remaining in the sieve as determined by the ratio of the weight of the 15 percent largest scallops (minimum three) divided by the 15 percent smallest scallops (minimum three). The number constituting this percentage shall be the closest approximation of 15 percent, determined by count.

(2) For Style II, deduction points are based on the percentage by count of small or large scallops deviating from the average weight within the package.

(b) For the purpose of rating the factor of uniformity, the schedules of deduction points in Table II apply. Frozen fried scallops which receive 20 deduction points for this factor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

§ 270.16 Absence of defects.

(a) Absence of defects refers to the degree of freedom from doubled and misshaped scallops, pieces of shell fragments and extraneous material. The defects of doubled and misshaped scallops are determined by examining the frozen product, whereas the defects of shell fragments and extraneous materials are determined by examining the product in the cooked state. Deduction points are based on the percentage by count of the scallops affected within the package, or the relationship between the number of defect instances and the number of scallops within the package.

(1) *Doubled scallops.* Two or more scallops that are joined together during the breading and/or frying operations.

(2) *Misshaped scallop.* Elongated, flattened, mashed or damaged scallop meats.

TABLE II—SCHEDULE OF POINT-DEDUCTIONS FOR UNIFORMITY

Factor	Method of determining subfactor score	Percent of scallops affected		Deduction points
		Over—	Not over—	
Uniformity of size and weight of scallops in frozen state.	A. Style I (Random pack)			
	(a) Undesirable small pieces which pass through a sieve with $\frac{3}{4}$ inch openings.	0 10 20	30 20 10	3 6 10
		Ratio		
		Over—	Not over—	
(b) Weight ratio of scallops remaining in the sieve. The 15 percent largest scallops (minimum three) divided by the 15 percent smallest scallops (minimum three). The 15 percent to be determined by count.		2.0 2.5 2.9 3.3	2.0 2.5 2.9 3.3	0 1 2 3
				10
	B. Style II (Uniform pack)			
	Deviates from average weight	Over—	Not over—	
(a) Small (scallops deviating ± 10 to 20 percent from average weight).		0 30 70	30 20 10	3 7 11
	(b) Large (scallops deviating over ± 20 percent from average weight).	0 30 70	30 20 10	3 7 11

TABLE III—SCHEDULE OF POINT-DEDUCTIONS FOR DEFECTS SURFACTORS MISSHAPED OR DOUBLED SCALLOPS AND SHELL FRAGMENTS

Defect subfactor	Method of determining subfactor score	Percent of scallops affected		Deduction points
		Over—	Not over—	
Misshaped or doubled scallops in the frozen state.	Misshaped scallops (elongated, flattened, mashed or damaged scallop meats). Doubled scallops (two or more scallops joined together during breading and/or frying operations).	0 10 20	30 20 10	3 7 11
Shell fragments in the cooked state.	Each piece of shell fragment is considered an instance.	0 5 10	5 10 —	15 30 40

TABLE IV—SCHEDULE OF POINT-DEDUCTIONS FOR DEFECTS SURFACTORS OF EXTRANEOUS MATERIAL

Number of scallops per 7 column	Number of instances of extraneous material							
	0	1	2	3	4	5	6	7 or more
Deduction points								
10 or less.....	0	7	15	25	40	—	—	—
11.....	0	6	15	25	40	—	—	—
12.....	0	5	15	25	40	—	—	—
13.....	0	5	11	25	40	—	—	—
14.....	0	4	10	15	25	40	—	—
15.....	0	4	9	15	25	40	—	—
16.....	0	3	8	15	25	40	—	—
17.....	0	3	8	12	25	40	—	—
18.....	0	2	7	10	15	25	40	—
19.....	0	2	6	9	15	25	40	—
20 or more.....	0	2	5	8	12	20	40	—

(3) *Extraneous material.* An instance of extraneous material refers to an occurrence or group of occurrences of extraneous material in a scallop. Extraneous material consists of sand, grit, intestines, seaweed and substances foreign to the scallop meat, except for shell fragments.

(4) *Piece of shell fragment.* The presence in the scallops of any fragment of the scallop shell regardless of size.

(b) For the purpose of rating the factor of absence of defects the schedules of deduction points in Tables III and IV apply.

§ 270.17 Character.

(a) Character refers to the texture of the scallop meat and of the coating and the presence of gristle in the cooked state. Deduction points are based on the degree of variation in the texture attributes of the coating and scallop meat or the relationship between the number of instances and the number of scallops within the package.

(1) *Gristle.* An instance of gristle refers to an occurrence of the tough elastic tissue usually attached to the scallop meat.

(2) *Texture* refers to the firmness, tenderness, and moistness of the cooked scallop meat and to the crispness and tenderness of the coating of the cooked product. The texture of the scallop meat may be classified as a degree of mushiness, toughness, and fibrousness. The texture of the coating may be classified as a degree of pastiness, toughness, dryness, mushiness, or oiliness.

TABLE V—SCHEDULE OF POINT-DEDUCTIONS FOR CHARACTER SUBFACTOR OF TEXTURE

Character subfactors	Method of determining subfactor score	Deduction points
Texture in the cooked state.	<i>Texture of the coating</i>	
	Firm or crisp but not tough, pasty, mushy, or oily.....	0
	Moderately tough, pasty, mushy, or oily.....	5
	Excessively tough, pasty, mushy, or oily.....	15
	<i>Texture of the scallop meat</i>	
	Firm, but tender and moist.....	0
	Moderately tough, dry, and/or fibrous or mushy.....	5
	Excessively tough, dry, and/or fibrous or mushy.....	15

easily be scraped off; provided that (1) the "debreaded" scallop is still solidly frozen, and (2) only a slight trace of blue color is visible on the surface of the "debreaded" scallop meat.

(iii) Remove the scallop from the bath; blot lightly with double thickness paper toweling; and scrape off or pick out coating from the scallop meat with the spatula or nut picker.

(iv) Weigh all "debreaded" scallop meats.

(v) Calculate the percent of scallop meat in the sample by following formula:

TABLE VI—SCHEDULE OF POINT-DEDUCTIONS FOR CHARACTER SUBFACTOR OF GRISTLE

Number of scallops per 7 ounces	Number of instances of gristles							
	0	1	2	3	4	5	6	7 or more
	Point deductions							
10 or less.....	0	2	4	6	8	10	12	14
11.....	0	2	4	6	8	10	12	14
12.....	0	2	4	6	8	10	12	14
13.....	0	1	3	5	7	9	11	13
14.....	0	1	3	5	7	9	11	13
15.....	0	1	3	5	7	9	11	13
16.....	0	1	3	5	7	9	11	13
17.....	0	1	3	5	7	9	11	13
18.....	0	1	3	5	7	9	11	13
19.....	0	1	3	5	7	9	11	13
20 or more.....	0	1	3	5	7	9	11	13

(b) For the purpose of rating the factor of character, the schedules of deduction points in Table V and VI apply. Frozen fried scallops which receive 15 deduction points for the factor of character shall not be graded above Sub-standard regardless of the total score for the product. This is a limiting rule.

DEFINITIONS AND METHODS OF ANALYSIS

§ 270.21 Definitions and methods of analysis.

(a) *Percent of scallop meat* refers to percent, by weight, of scallop meat in a sample as determined by the following method:

$$\text{Percent scallop meat} = \frac{\text{Weight of scallop meats (iv)}}{\text{Weight of frozen fried scallops (i)}} \times 100$$

(i) *Equipment needed.* (i) Water bath (3 to 4 liter beaker).

(ii) Balance accurate to 0.1 gram.

(iii) Clip tongs of wire, plastic, or glass.

(iv) Stop-watch or regular watch with second hand.

(v) Paper towels.

(vi) Spatula, 4-inch blade with rounded tip.

(2) *Procedure.* (i) Weigh all scallops in the sample while still in a hard frozen condition.

(ii) Place each scallop individually in the water bath which is maintained at 63° to 86° F. and allow the scallop to remain until such time as the breading becomes soft and can easily be removed from the still frozen meat (between 10 to 30 seconds for scallops held in storage at 0° F.).

NOTE: Several dry runs are necessary to determine the exact dip time required for "debreaded" the scallops in a lot sample. For dry runs only, a saturated solution of copper sulfate (500 grams of copper sulfate in 2 liters of tap water) is necessary. The correct dip time is the minimum time required to dip the scallops in the (copper sulfate) solution so that the breading can

(b) *Cooked state.* Cooked state shall mean that the product shall be cooked in accordance with the instructions accompanying the product. If specific instructions are lacking, the product for inspection shall be cooked as follows: Spread the frozen scallops on a foil covered baking sheet or a shallow pan. Place sheet or pan and frozen contents at the mid point of a properly ventilated oven pre-heated to 400 degrees Fahrenheit until thoroughly cooked, 15 to 20 minutes.

(c) *Definitions.* (1) "Moderate" refers to a scored condition that is readily noticeable but is not seriously objectionable.

(2) "Excessive" refers to a condition that is very noticeable and is seriously objectionable.

(3) "Instance" refers to an occurrence of an individual scored subfactor on a scallop.

LOT CERTIFICATION TOLERANCES

§ 270.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified in accordance with Part 260 of this chapter (Regulations Governing Processed Fishery Products, Vol. 25 F.R. 8431, Sept. 1, 1960.)

Note: See *Commercial Fisheries Review*, September 1961 p. 112.

FEDERAL STANDARD PROPOSED FOR GRADES OF FROZEN FLOUNDER AND SOLE FILLETS:

A proposed voluntary standard for grades of frozen flounder and sole fillets was announced in the January 5, 1962, Federal Register. The proposed standard, if made effective, will be the first issued by the Department of the Interior prescribing Government standards for these types of fillets.

Description of the product: Frozen flounder and sole fillets consist of clean, wholesome fillets processed and frozen in accordance with good commercial practice and maintained at temperatures necessary for their preservation. The fillets may be cut transversely or longitudinally into subunits. This standard does not provide for the grading of portions or units cut from previously frozen fish blocks, slabs, or similar material.

The product covered by this standard is prepared from the following species only:

Sole:

Dover sole (*Microstomus pacificus*)

English sole (*Parophrys vetulus*)

Gray sole (*Glyptocephalus cynoglossus*)

Petrale sole (*Eopsetta jordani*)

Lemon sole (*Pseudopleuronectes americanus*, over 3½ pounds)

Rock sole (*Lepidopsetta bilineata*)

Sand sole (*Psittichthys melanostictus*)

Flounder:

Blackback (*Pseudopleuronectes americanus*, less than 3½ pounds)

Yellowtail flounder (*Limanda ferruginea*)

Dab, plaice (*Hippoglossoides platessoides*)

Fluke (*Paralichthys dentatus*)

Starry flounder (*Platichthys stellatus*)

A number of styles are described. Style I consists of solid pack where the fillets are frozen together. This style is subdivided into: A--fillets packed into a single solid block, and B--fillets packed and frozen with separators into smaller weight units. Style II consists of individually-quick-frozen fillets.

As published, the proposed standard describes the product, styles of pack, grades, determination of the grade, definitions, and tolerances for certification of officially drawn samples.

Interested persons had until February 4, 1962, to submit written comments, suggestions, or objections on the proposed standard.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

USE OF SODIUM NITRATE IN SMOKED CURED SHAD:

A further extension to January 1, 1963, permitting the use of sodium nitrate under specified conditions in the curing of shad was announced by the U. S. Food and Drug Administration in the Federal Register of December 30, 1961. The extension and use was granted under the Federal Food, Drug, and Cosmetic Act as amended. The limit is 200 p.p.m. expressed as nitrite. The notice indicates that a progress report is required by July 1, 1962, on the research studies to determine the safety of the specified process.

The order was incorporated in the regulations under "Part 121--Food Additives, subpart A, section 121.90."



Department of the Treasury

COAST GUARD

AUTHORIZED TO INTENSIFY OCEANOGRAPHIC STUDIES:

With the U. S. Coast Guard authorized to continue and intensify its oceanographic studies, United States, efforts to probe the secrets of the sea were given new impetus. The Coast Guard's long experience in the field of oceanography which extends over nearly a century was recognized when the Coast Guard Oceanography Bill (H. R. 6845) was signed by President Kennedy on October 5 as Public Law 87-396. This permits the Coast Guard to carry out its oceanographic research without restriction and under formal sanction of the United States Government.

Practical effect of the new authority will be to permit the Coast Guard to expand the range and effectiveness of its oceanographic program. At present, four ocean stations in the Atlantic and two in the Pacific are maintained the year-around. A total of 36 major cutters are involved at various times. With equipment such as precision depth recorders, oceanographic winches, and salinometers,



Fig. 1 - Under the new Coast Guard Oceanography law, major Coast Guard cutters may be more adequately equipped to provide a wider range of information about the sea and air than they now do. Affected will be such vessels as the 255-ft. class, represented here by the Androscooggin, which have regularly served other agencies and organizations as testing platforms for oceanographic and hydrographic research while manning ocean stations and performing other duties at sea.

they will add much information to the soundings, sea and swell observations, fish, bird and other wildlife counts, sea temperatures at different depths, drift bottle casts, plankton samplings, and water and air samplings they are now providing.

The new offshore light stations the Coast Guard is now building to replace most of its lightships, have already been designed for measurement of tides, waves, coastal current, and air-sea boundary processes. This will be in addition to their regular duties of aiding navigation.

Eventually, additional Coastguardsmen will be trained in the operation and maintenance of measuring equipment and will gain the basic knowledge for taking accurate measurements.

In the past, the Coast Guard's contributions to oceanography have been considerable. It has a history and tradition in the marine sciences which goes back to 1867 when the Revenue Cutter Lincoln was dispatched to chart the waters surrounding the newly purchased territory of Alaska. The Bering Sea Patrol dating back to 1870 has made vast

contributions in exploring and charting Alaskan waters which are rich in fish and wildlife.

Coast Guard cutters have pioneered oceanographic surveys of the North American Arctic. The cruises of the Cutter Corwin in 1884, the Marion in 1931, the Chelan in 1937 and the Northland in 1938-39 stand as mileposts of United States efforts in the Arctic.

Coast Guard oceanographic work falls into two categories: (1) oceanographic research in support of the International Ice Patrol, and (2) work performed for other agencies and organizations. A large part of Coast Guard oceanographic work is done in connection with its International Ice Patrol.



Fig. 2 - A large part of U. S. Coast Guard oceanographic research has been done in connection with its role of conducting the International Ice Patrol. Here aboard the specially-equipped Coast Guard oceanography cutter Evergreen trained personnel record temperatures of water samples collected in Nansen bottles from some of the 475 selected stations the cutter occupies during her iceberg season and post-season surveys in the West Greenland Current, Labrador Sea, and Baffin Bay.

For 47 years, in order to find out more about the conditions that spawn North Atlantic Icebergs, specially equipped cutters like the present-day Evergreen, have conducted oceanographic surveys in the Labrador Current and the Gulf Stream off the Grand Banks of Newfoundland. Post-iceberg season oceanographic cruises are made in the West Greenland Current, Labrador Sea, and across Baffin Bay. At present, approximately 475 hydrographic stations are occupied in these regions each year. Temperature and salinity measurements are made to depths of 5,000 feet. Surface and subsurface currents are measured. After the data are processed both aboard the research vessel and later back at

Woods Hole, Mass., a complete report is published once each year.

The International Ice Patrol oceanographic program has served as a cornerstone for American Oceanographic practices. Some of the highlights are: (1) the determination of ocean currents by dynamic topography in 1921, (2) development of the salinometer in 1926, (3) use of the geomagnetic current meter in 1948, (4) airborne radiometry in 1954, (5) and in the 1961 season, three deep-sea oceanographic bouys in the Labrador Sea. The Patrol's work is mature enough to have reaped the rewards of its own research. In the words of the late world renowned oceanographer, Harold Sverdrup, former director of the Scripps Institution "The work of the Coast Guard is the outstanding example of practical application of the methods of computing ocean currents."

In cooperating with agencies, Coast Guard ships collect about 26,000 bathythermograph observations a year. Seven lightships in addition to bathythermograph observations, collect water samples and make other observations for various research organizations. As part of Navy resupply operations in the Arctic and Antarctic, the Coast Guard icebreakers Eastwind, Northwind, and Westwind make many valuable contributions.

The Eastwind on her return from the 1960 Antarctic Operation DEEPFREEZE, transited the Indian Ocean. She completed some 30 oceanographic stations as a contribution to the Indian Ocean Expedition under the coordination of the National Science Foundation and cooperation of the Hydrographic Office.

The icebreaker Northwind commenced American oceanographic studies in Antarctica following World War II and in the fall of 1960 conducted an oceanographic cruise of Alaskan and Siberian Seas. Her performance in routinely occupying 105 oceanographic station in those regions at such a late season is attested to by the U. S. Navy commendation which states "a feat unequaled by any icebreaker."

A total of 45 Coast Guard vessels routinely supply the Navy Hydrographic Office with approximately 360,000 miles of bathymetric surveys each year.

The new law is a result of the President's urgings to Congress stressing the importance of developing our knowledge of the oceans. He has stated that our very existence may hinge

upon this knowledge. Besides advantages to our military forces, more knowledge of the oceans may make available a wealth of nutritional and mineral resources, and help predict or perhaps someday control the weather.

With the new clearcut authority for the Coast Guard to engage in oceanographic research, development of an increased well-planned program is now possible. The Coast Guard will contribute its part towards helping the United States cross the threshold of our knowledge of the oceans.



Eighty-Seventh Congress (Second Session)

CONGRESS RECONVENES: The second session of the 87th Congress convened January 10, 1962. The first session adjourned September 27, 1961. All legislation before the House and Senate during the first session remained in its status as of adjournment and is subject to further consideration during this second session. Bills introduced in the first session do not have to



be reintroduced. Bills reported out of a committee or passed by one body of Congress remain in status quo and do not have to retrace legislative steps during the second session.

BUDGET OF THE UNITED STATES: H. Doc. No. 266, The Budget of the United States Government for the Fiscal Year Ending June 30, 1963, 87th Congress, 2nd Session, 1,171 pp., printed. (For sale by the Superintendent of Documents, Washington 25, D. C., for \$6.00.) The budget as submitted Jan. 18, 1962, to the Congress, provides increases in budget estimates for the Fish and Wildlife Service. For the Office of the Commissioner \$364,000--the same as in 1962. Estimates for Bureau of Sport Fisheries and Wildlife total \$68,610,000 as compared with \$62,153,000 in 1962. Increases are proposed in management and investigations of resources, construction, general administrative expenses, and grants to states and local governments under permanent authorizations. The 1963 budget estimates for the Bureau of Commercial Fisheries total \$35,418,000 as compared to \$32,657,000 for fiscal 1962. Management and investigations of resources

would be increased to \$20,115,000 from \$17,506,000 in fiscal 1962; total construction would amount to \$8,414,000 as compared to \$8,600,000 in 1962; general administrative expenses would be increased to \$983,000 as compared to \$849,000 in 1962; Administration of Pribilof Islands would be \$1,998,000 as compared to \$1,981,000 in 1962; payment to Alaska from Pribilof Islands fund \$622,000 as compared with \$537,000 in 1962; Fisheries Loan Fund would be increased to \$2,505,000 as compared with \$2,414,000 in 1962. Construction of fishing vessels (fishing vessel construction differential subsidy) remains the same as 1962 at \$750,000. Total amount of the estimates for the Fish and Wildlife Service is \$104,392,000, compared to \$95,174,000 in 1962.

FISH AND WILDLIFE AID THROUGH EQUIPMENT TRANSFER: H.R. 9527 (McIntire) introduced in House Jan. 10, 1962; to provide that surplus property of the United States may be donated to the states for the promotion of fish and wildlife management activities, and for other purposes; to the Committee on Government Operations. Similar to other bills introduced in First Session.

FISH AND WILDLIFE LEGISLATION: Miscellaneous Fish and Wildlife Legislation (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-Seventh Congress, First Session), 289 pp., printed. Contains hearings on H.R. 206, to facilitate administration of the fishery loan fund established by section 4 of the Fish and Wildlife Act of 1956, and for other purposes; H.R. 682, relating to documentation and inspection of vessels of the United States; H.R. 777, for the protection of marine mammals on the high seas, and for other purposes; H.R. 2894 and S. 606, to provide for the construction of a shellfisheries research center at Milford, Conn.; H.R. 3159, to permit certain foreign-flag vessels to land their catches of fish in the Virgin Islands in certain circumstances, and for other purposes; H.R. 3788, to provide for the transfer of the United States vessel Alaska to the State of California for the use and benefit of the Department of Fish and Game of such state; and H.R. 1171, to increase the public benefits from the national fish and wildlife conservation areas through their incidental or secondary use for public recreation, and for other purposes.

FISH HATCHERY: H.R. 9623 (Evins) introduced in House Jan. 11, 1962; to establish, construct, equip, operate, and maintain a fish hatchery in Clay County, Tenn.; to the Committee on Merchant Marine and Fisheries. Similar to other bills on same subject.

PRESIDENT'S STATE OF THE UNION MESSAGE: The President on Jan. 11 delivered his State of the Union Message (H. Doc. No. 251) to a joint session of Congress. Under the subject of "Agriculture and Resources," the President stated: "We also need for the sixties--if we are to bequeath our full national estate to our heirs--a new long-range conservation and recreation program--... new starts on water and power projects as our population steadily increases--..." On the subject of "Trade," the President stated: "Above all, if we are to pay for our commitments abroad, we must expand our exports. . . . But the greatest challenge of all is posed by the growth of the European Common Market. Assuming the accession of the United Kingdom, there will arise across the Atlantic a trading partner behind a single external tariff similar to ours with an economy which nearly equals our own. Will we in

this country adapt our thinking to these new prospects and patterns--or will we wait until events have passed us by?

"...I shall shortly send to the Congress a new 5-year trade expansion action, far reaching in scope but designed with great care to make certain that its benefits to our people far outweigh any risks. The bill will permit the gradual elimination of tariffs here in the United States and in the Common Market on those items in which we together supply 80 percent of the world's trade--mostly items in which our own ability to compete is demonstrated by the fact that we sell abroad, in these items, substantially more than we import. This step will make it possible for our major industries to compete with their counterparts in Western Europe for access to European consumers.

"On the other hand, the bill will permit a gradual reduction of duties up to 50 percent--permit bargaining by major categories--and provide for appropriate and tested forms of assistance to firms and employees adjusting to import competition. We are not neglecting the safeguards provided by peril points, an escape clause, or the national security amendment. Nor are we abandoning our non-European friends or our traditional most-favored-nation principle...."

SALMON IMPORT RESTRICTIONS: H.R. 9547 (Pelly) introduced in House Jan. 10, 1962; to facilitate the application and operation of the Fish and Wildlife Act of 1956; to the Committee on Merchant Marine and Fisheries. The bill would prohibit the import of salmon products derived from fish caught by nationals of any country that permits fishing for salmon by gill nets on the high seas at times and places where occur large quantities of immature salmon of North American origin. Also introduced in Senate, Jan. 18, 1962, S. 2707 (Magnuson), similar to House bill.

TRADE ADJUSTMENT ACT OF 1962: S. 2663 (Sparkman) introduced in Senate Jan. 11, 1962; to provide assistance to business enterprises and individuals to facilitate adjustments made necessary by the trade policy of the United States; to the Committee on Finance. The purpose is to offset the impact on American businesses, especially smaller businesses, of a more liberal national trade policy by a broad-gauge program of adjustment assistance. Eligibility would be determined by a new trade adjustment division in the Tariff Commission. Certificates of eligibility for assistance of import-affected businesses and workers would be issued. Business enterprises and workers who are adversely affected by the trade policy of the United States are eligible for assistance. Would amend the Trade Agreement Extension Act of 1961 with reference to

peril-point provisions, and escape-clause provisions to permit the Tariff Commission to recommend invocation of the Trade Adjustment Act as an alternative to a recommendation of an increase or of no decrease in existing customs treatment or import restrictions. Would create an interagency committee on trade adjustment to determine the kinds and amounts of assistance needed by those classes of business enterprises and workers found by the Tariff Commission to be eligible for the benefits provided by the act. Would authorize the President to invoke the Trade Adjustment Act as an alternative to increased or continued rates of duty. With respect to the powers and functions of the President on the peril-point and escape-clause provisions of the Trade Agreement Extension Act of 1951, would authorize him, in either case, to invoke trade adjustment rather than continued or increased rates and types of protection. Would have the business concern which the Tariff Commission has certified to be eligible for the benefits of the act apply to the Small Business Administration for technical advice and assistance. Would also empower the SBA to grant trade adjustment loans. Would authorize SBA to make grants up to \$25,000 to eligible business enterprises for procuring technical assistance in the private business community, to make detailed plans for their adjustment to changed conditions and to new lines, when a need to do so has been occasioned by the trade policy of the United States. Would permit SBA to make all of its programs authorized under the Act available to all certified eligible businesses not dominant in their lines, whether or not they are technically small businesses. Would amend section 4 (c) of the Small Business Act to increase the authorized appropriation to the section 7 (b) revolving loan fund by \$100 million, the entire amount of the increase to be earmarked for the new trade adjustment loan program. Would include an unemployment assistance program as well as training and transportation provisions for workers; provisions for retirement of eligible workers under Social Security age 60; also accelerated amortization. Also introduced in House: H.R. 9741 (Multer) January 18, 1962, H.R. 9806 (Miller) Jan. 22, 1962, and H.R. 9846 (Patman) Jan. 23, 1962; all similar to Senate bill.

TRADE AGREEMENTS ACT OF 1961: H.R. 9504 (Chelf) introduced in House Jan. 10, 1962; to protect the domestic economy, promote the national defense and regulate the foreign commerce of the United States by adjusting conditions of competition between domestic industries and foreign industries, and for other purposes; to the Committee on Ways and Means. Somewhat similar to S. 2663 cited as the Trade Adjustment Act of 1962 but with substantial differences. H.R. 9504 is cited as the Trade Agreements Act of 1961.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

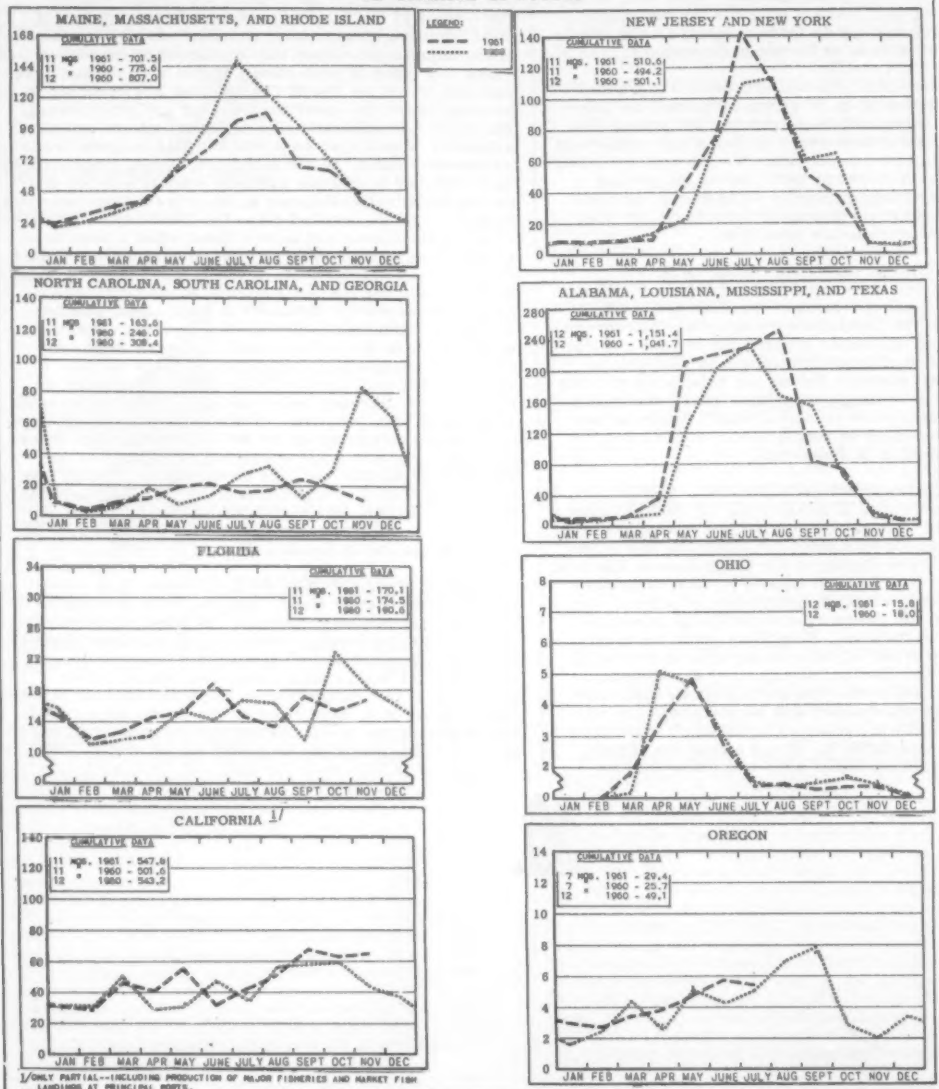
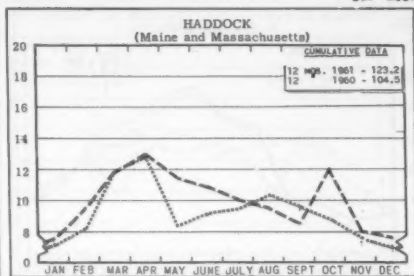
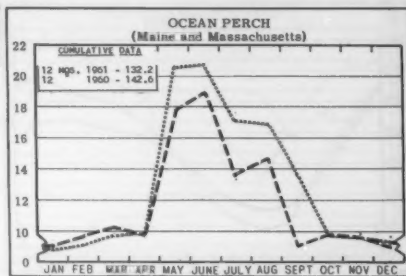


CHART 2 - LANDINGS for SELECTED FISHERIES

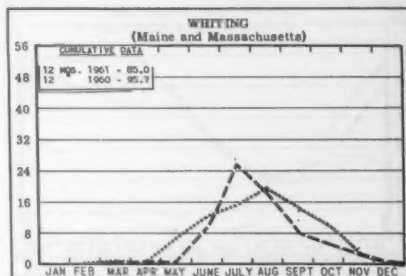
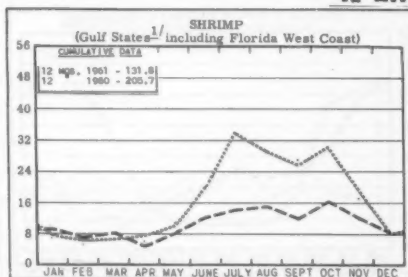
In Millions of Pounds



LEGEND:
----- 1961
..... 1960

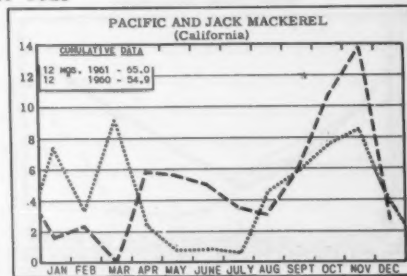
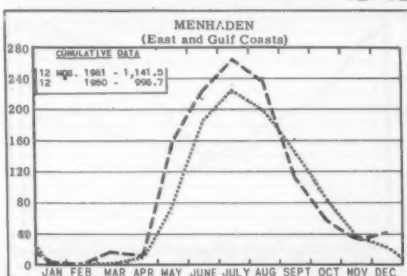


In Millions of Pounds



^{1/}L.A. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

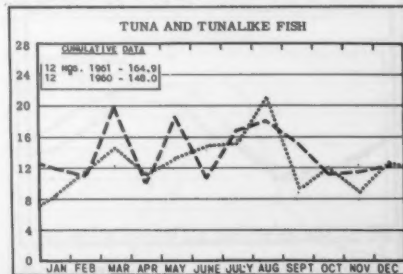
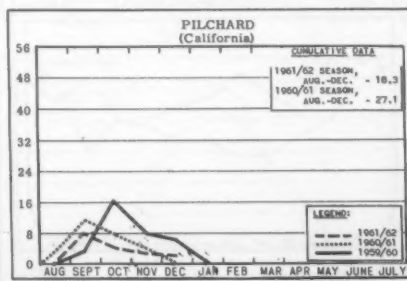
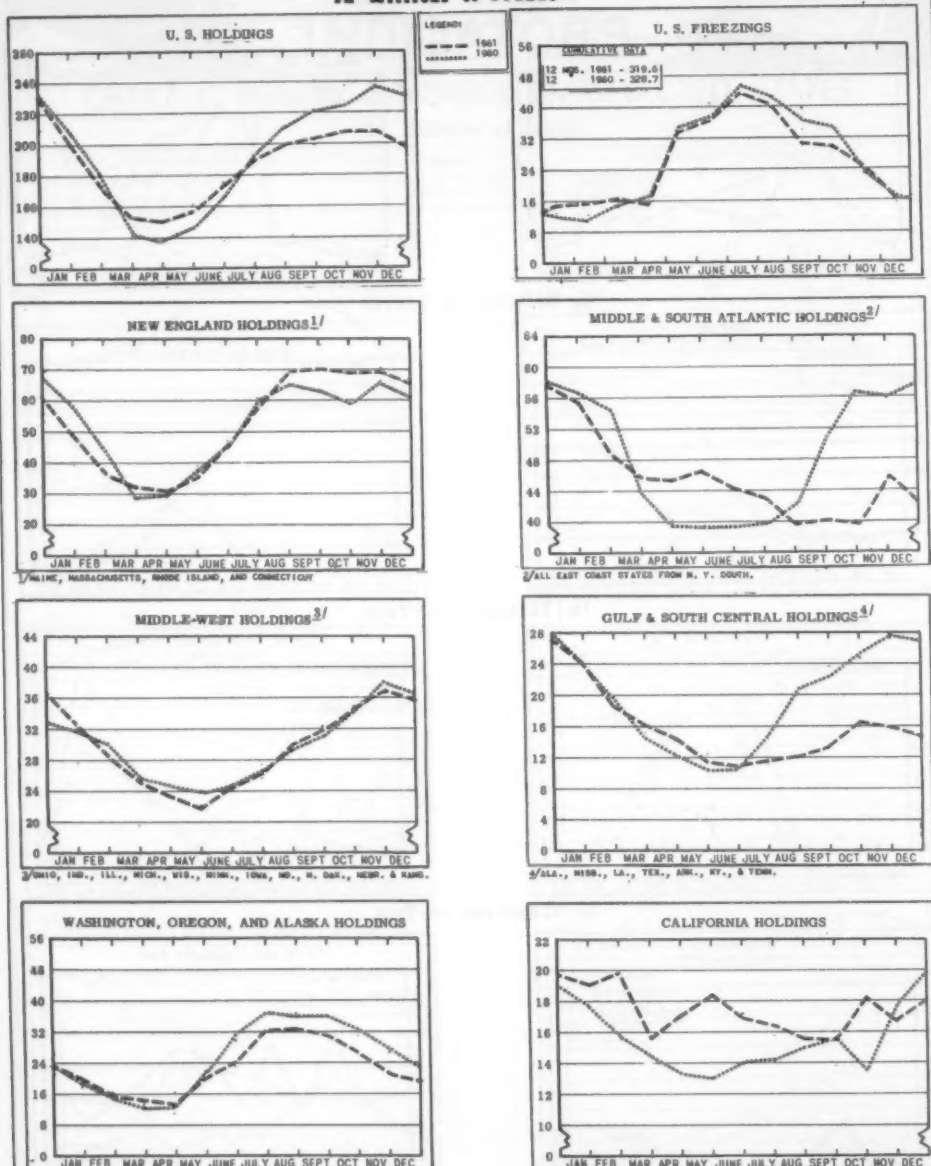


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

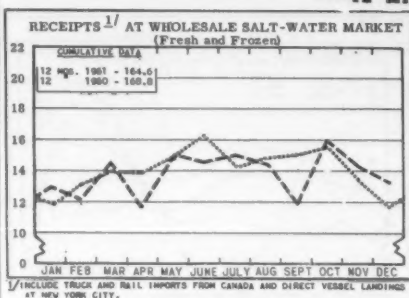
In Millions of Pounds



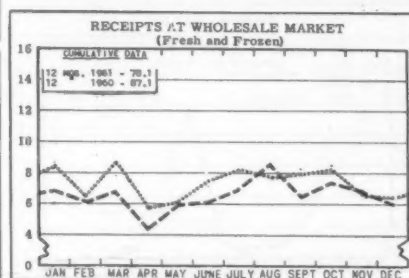
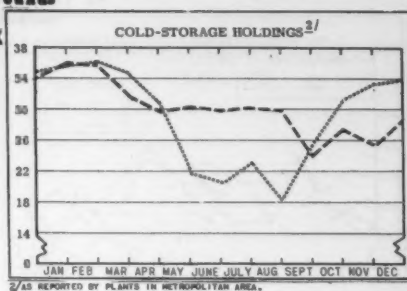
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

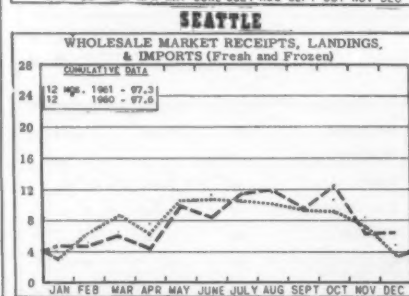
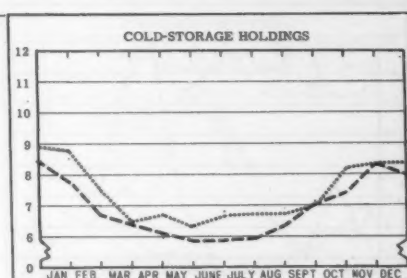
In Millions of Pounds



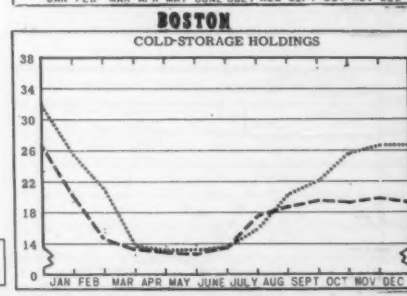
NEW YORK CITY



CHICAGO



SEATTLE



BOSTON

LEGEND:
— 1961
--- 1960

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

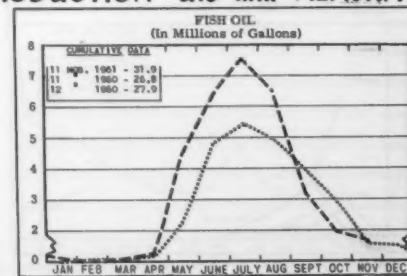
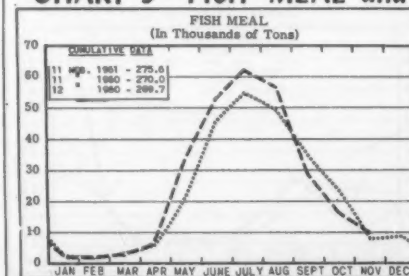
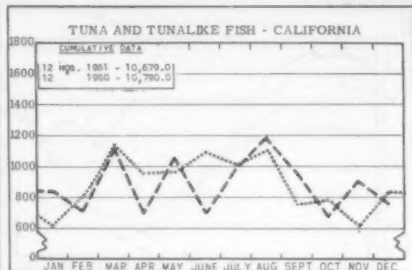
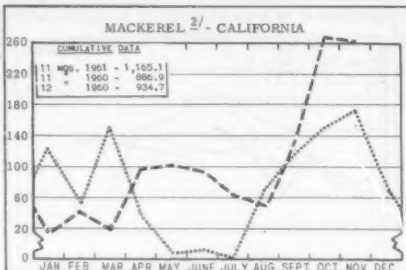


CHART 6 - CANNED PACKS of SELECTED FISHFRY PRODUCTS

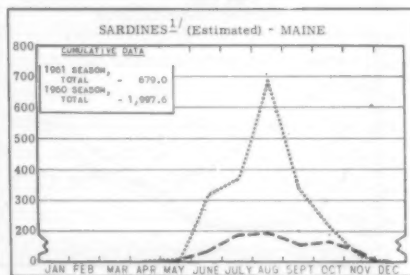
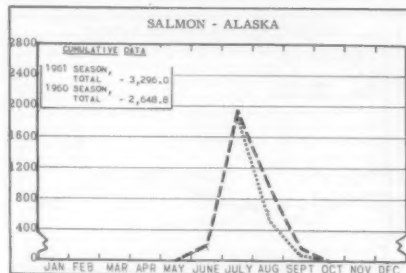
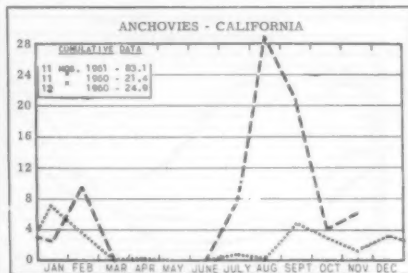
In Thousands of Standard Cases



LEGEND:
— 1961
- - - 1960



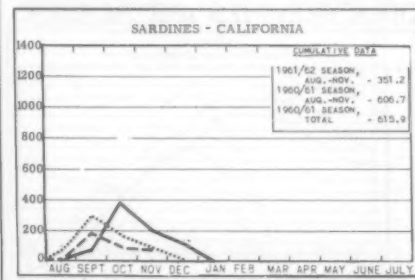
^{2/} INCLUDED PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{2}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	$\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	$\frac{1}{2}$ oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



LEGEND:
— 1961/62
- - - 1960/61
- - - 1959/60

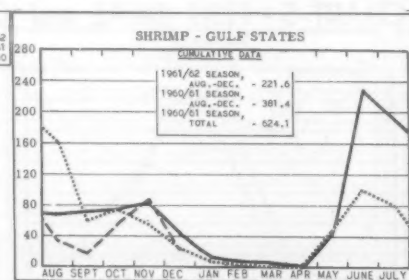
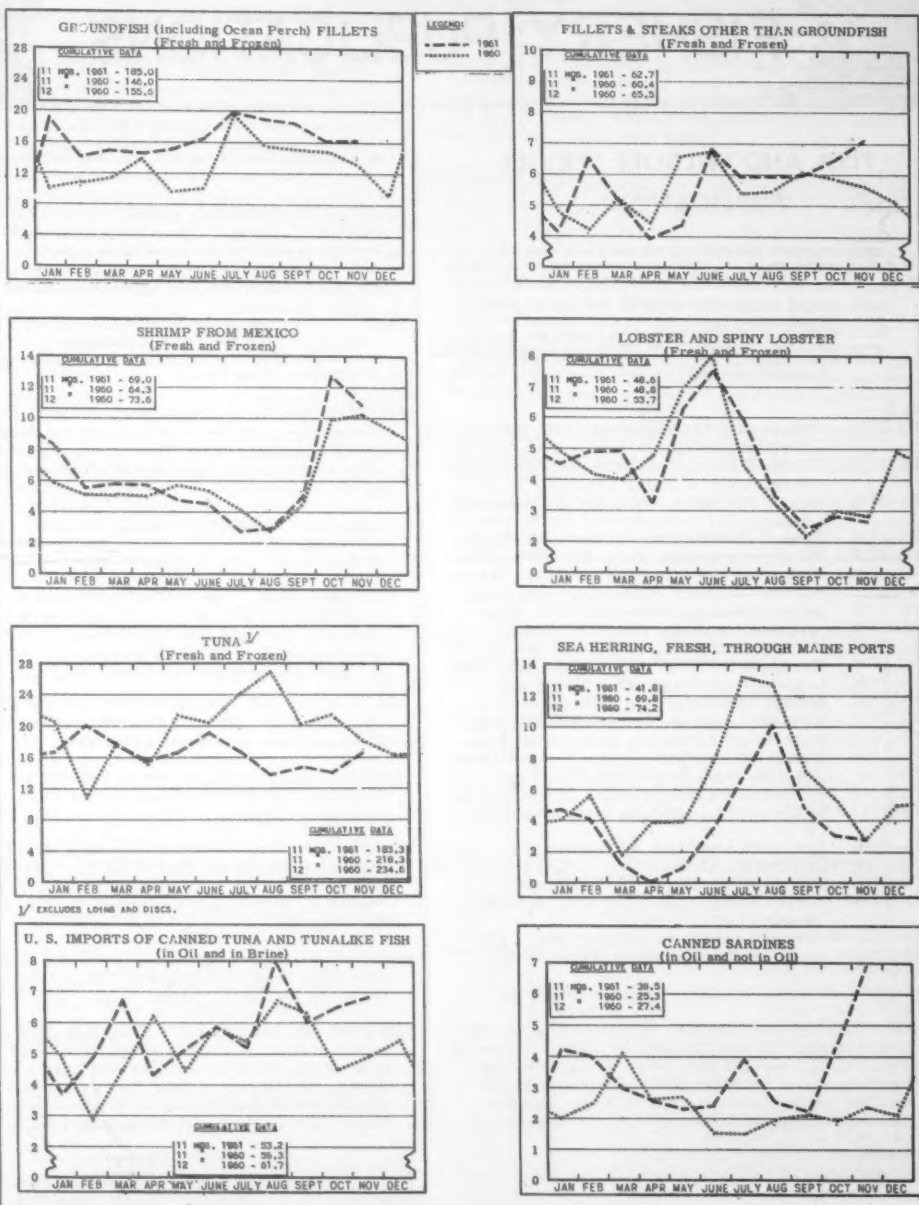
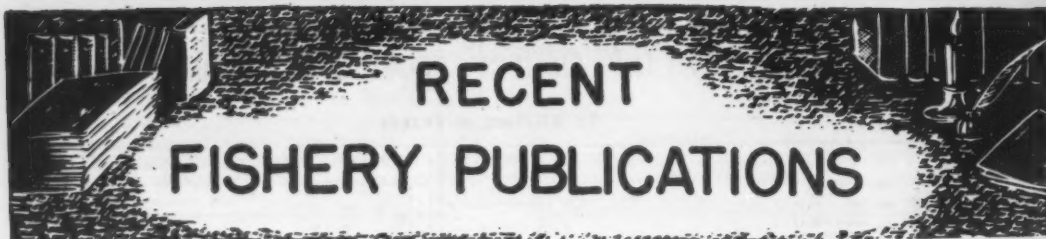


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
HML - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|---|
| CFS-2566 | - Middle Atlantic Fisheries, 1960, Annual Summary, 8 pp. |
| CFS-2723 | - Alaska Fisheries, 1960, Annual Summary, 8 pp. |
| CFS-2724 | - Hawaii Fisheries, 1960, Annual Summary, 4 pp. |
| CFS-2728 | - Frozen Fish Report, October 1961, 8 pp. |
| CFS-2729 | - Michigan Landings, September 1961, 2 pp. |
| CFS-2730 | - Fish Meal and Oil, September 1961, 2 pp. |
| CFS-2731 | - Florida Landings, September 1961, 9 pp. |
| CFS-2732 | - Maine Landings, September 1961, 4 pp. |
| CFS-2733 | - Alabama Landings, June 1961, 3 pp. |
| CFS-2734 | - Alabama Landings, July 1961, 3 pp. |
| CFS-2735 | - Maryland Landings, September 1961, 3 pp. |
| CFS-2736 | - Louisiana Landings, June 1961, 2 pp. |
| CFS-2737 | - Shrimp Landings, July 1961, 6 pp. |
| CFS-2738 | - Virginia Landings, September 1961, 4 pp. |
| CFS-2739 | - Mississippi Landings, August 1961, 2 pp. |
| CFS-2740 | - Wisconsin Landings, September 1961, 2 pp. |
| CFS-2741 | - Ohio Landings, September 1961, 2 pp. |
| CFS-2742 | - Minnesota Landings, September 1961, 2 pp. |
| CFS-2743 | - Rhode Island Landings, September 1961, 3 pp. |
| CFS-2744 | - New York Landings, September 1961, 5 pp. |
| CFS-2745 | - California Landings, July 1961, 4 pp. |
| CFS-2748 | - Louisiana Landings, July 1961, 2 pp. |
| CFS-2749 | - North Carolina Landings, October 1961, 4 pp. |
| CFS-2751 | - Maryland Landings, October 1961, 3 pp. |
| CFS-2755 | - South Carolina Landings, October 1961, 2 pp. |
| CFS-2756 | - Florida Landings, October 1961, 8 pp. |
| FL-520 | - Biology and Methods of Controlling the Starfish, <i>Asterias forbesi</i> (Desor), by Victor Loosanoff, 11 pp., illus., revised July 1961. A report on the starfish, one of the most destructive enemies of shellfish on the Atlantic coast of North America. Discusses the distribution and occurrence of |

of starfish, their food and feeding, habits, mechanical and chemical methods of control, and utilization.

FL-521 - The Menhaden Fishery of the United States, by Fred C. June, 13 pp., illus., August 1961. This report describes the menhaden resource, reviews and describes the fishery, and gives a summary of the life history and biology of Atlantic menhaden.

FL-528 - How about the New Marine Oils, 8 pp., illus. This report answers three questions: What are Marine Oils, How are Marine Oils Produced, and How are Marine Oils Used?

SSR-Fish. No. 375 - New England Haddock Fishery Biostatistics--1956, by John R. Clark and Frank A. Dreyer, 87 pp., illus., April 1961. A statistical review of the haddock fishery of New England banks (Subarea 5 of the International Commission for the Northwest Atlantic Fisheries) for the 1956 haddock year. Estimates of total fishery removals are given for scrod and large haddock, both landed and discarded at sea, by month and area of capture. The estimated age and length compositions of the total haddock discard for 1956 are given. Age and length compositions are estimated by months for haddock landed from Georges Bank and by season for haddock landed from Gulf of Maine. Also the fishing effort and abundance estimates are given for Georges Bank by months.

SSR-Fish. No. 377 - North Pacific and Bering Sea Oceanography, 1959, by Felix Favorite and others, 216 pp., illus., processed, May 1961.

SSR-Fish. No. 378 - Drift Bottle Records for the Gulf of Maine, Georges Bank and Bay of Fundy, 1956-58, by Dean F. Bumpus, 128 pp., illus., May 1961.

SSR-Fish. No. 380 - Water Temperatures off the South Atlantic Coast of the United States--Theodore N. Gill Cruises 1-9, 1953-54, by William W. Anderson, Joseph E. Moore, and Herbert R. Gordy, 212 pp., ill., May 1961.

SSR-Fish. No. 388 - Tolerance of Striped Bass and American Shad to Changes of Temperature and Salinity, by Marlin E. Tagatz, 8 pp., August 1961.

SSR-Fish. No. 391 and 392 - Effects of DDT Spray on Fish and Aquatic Insects in Gallatin River Drainage in Montana, by W.R. Bridges and Austin K. Andrews; and Effects of DDT Spray on Stream Bottom Organisms in Two Mountain Streams in Georgia, by Paul J. Frey, 14 pp., illus., August 1961.

Sep. No. 635 - Principal Species of Commercial Shrimp in Argentina.

Sep. No. 636 - Exploratory Fishing off the Coast of North Carolina, September 1959-July 1960.

Sep. No. 637 - Soft-Crab Industry.

Sep. No. 638 - North Pacific Fishery Research Vessels.

Fisheries Loan Fund, Fiscal Year 1960, Circular 123, 8 pp., illus. processed, 1961. Discusses the Bureau of Commercial Fisheries loans and grants activities, status of the fishery loan fund, and use of proceeds of loans. Includes graphs showing number of loan applications, value of applications, and other similar data.

Galveston Biological Laboratory Fishery Research, (Fiscal Year 1961), Circular 129, 85 pp., illus., July 1961. Summarizes the research work carried out at the Galveston Biological Laboratory during the fiscal year ended June 30, 1961. Describes in detail the research programs on the shrimp fishery, industrial fishery, estuarine, physiology and pesticide, and red tide. Also includes special reports on the sea-water shrimp, oyster studies, and distribution of pink shrimp larvae and postlarvae.

The Pacific Region of the Bureau of Commercial Fisheries, by Thomas O. Duncan, Fish and Wildlife Circular 108, 17 pp. processed. Discusses the activities of the Pacific Region of the U.S. Bureau of Commercial Fisheries, which range from basic research on the populations of fish and the many factors influencing their abundance, to the product on the consumer's table. Between these extremes, the Bureau's work involves various types of problems in many fields of science and technology.

Progress in 1960, Circular 127, 31 pp., illus. This report summarizes scientific accomplishments for the year 1960 and plans for the future for the Bureau of Commercial Fisheries Biological Laboratory at Honolulu. Discusses briefly the Laboratory's research on oceanography, marine biology, etc.

Research Program of the Ichthyological Laboratory, Circular 124, by Daniel M. Cohen, 8 pp., processed. Discusses the program of the Ichthyological Laboratory, its objectives, problems, solutions, and future plans.

Sharks, Skates, Rays, and Chimaeras, by J. R. Thompson and Stewart Springer, Circular 119, 19 pp., illus., processed. A general introduction to the class Chondrichthyes (sharks, skates, rays, and to a lesser extent, chimaeras). Material included encompasses, in broad terms, characteristics of the class and of its components. General statements on reproduction, numbers and general distribution, size, food and feeding, sensory perception, structural adaptations to specific modes of life, and relation to man are included. A short annotated list of references directs the reader to more specific and detailed sources for further study.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE
BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S.
FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-62	Centolla (King Crab) Industry, Punta Arenas-Provenir, Chile, July 1961.

MNL-63 - Annual Report on Egyptian Fisheries, 1960.
MNL-64 - Fish Body Oil Markets in France.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, October 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, October 1961, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tuna-like fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, October and November 1961, 14 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf of Mexico Monthly Landings. Production and Shipments of Fishery Products, October and November 1961, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, November 1961, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, October, 1961, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports

and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Providencetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New England Sea Scallop Fishery, and Marketing of Sea Scallop Meats, 1939-60, by John J. O'Brien, 48 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) A special report on the sea scallop fishery of New England and the marketing of sea scallop meats (domestic and foreign). Summarizes all the pertinent data scattered through many Market News Service reports and other publications during the period (1939-1960), which goes back to the first complete year of operation of the Boston Fishery Market News Service. Included in the report is a brief analysis of the trends in the 1939-60 period, and the important developments that affected the New England sea scallop fishery and industry. Also relates some of the history of the fishery. It includes data on landings and ex-vessel prices of the sea scallop fishery in New England; primary wholesale prices, imports, stocks, market trends, receipts on some wholesale Markets, and some retail prices for sea scallop meats. Also includes landings and ex-vessel prices in some competitive ports.

New York City's Wholesale Fishery Trade--Monthly Summary--August 1961, 24 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesaler's selling prices for fresh frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, October and November 1961, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the months indicated.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF.:

The Study on the Color of the Fishing Net. III--Effect of the Depth of Color of a Net on the Behavior of a

Fish School Near the Net, by Kenji Kanda, and others. Translation Series No. 3, 4 pp., processed, November 1961. (Translated from Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 10, p. 621-624 1958.)

Summary of Observations on Oyster Setting in Long Island Sound during the Summer of 1961, by V. L. Loosanoff, vol. 25, Bulletin No. 8, December 11, 1961, 9 pp., illus., processed. (Biological Laboratory, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Milford, Conn.) The report discusses the number and location of observation and sampling areas, operation of the spat collectors, procedure followed in observations, and analysis of findings. Included are illustrations and statistical tables showing results of sampling at the various stations.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Blood Properties of Prespawning and Postspawning Anadromous Alewives (ALOSA PSEUDOHARENGUS), by Carl J. Sindermann and Donald F. Mairs, Fishery Bulletin of the Fish and Wildlife Service, vol. 61, 11 pp., illus., printed, 15 cents, 1961.

Effects of Copper Ore on the Ecology of a Lagoon, by Kenneth T. Marvin, Larence M. Lansford, and Ray S. Wheeler, Fishery Bulletin 184 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), 12 pp., printed, 15 cents, 1961.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ABALONE:

"Photosensitization of Animals by the Viscera of Abalone, *Haliotis* Spp.," by Yoshiro Hashimoto, Koji Naito, and Junzo Tautsami, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, December 1960, pp. 1216-1221, printed in Japanese and English. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

ALGAE:

"A List of Marine Algae Collected in the Vicinity of Oshoro Marine Biological Station, at Oshoro, Hokkaido, Japan," by Jun Tokida and Tomitaro Masaki, article, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 10, November 1959, pp. 173-195, printed in Japanese. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"On a New Amino Acid (Chondrine) Isolated from Red Alga *Chondria crassicaulis*," by Mitsuo Kuriyama, Mitsuzo Takagi and Kiichi Murata, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, June 1960, pp. 627-631, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, Tokyo, Japan.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

ANIMAL NUTRITION:

"The Effect of Unidentified Growth Factor Sources and Restricted Feeding on the Performance of Egg Strain Chickens," by W. F. Pepper, S. J. Slinger, and G. C. Ashton, article, Poultry Science, vol. 40, p. 588, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio.

ANTIOXIDANTS:

"Estimation of Antioxidants Added to Marine Products. I--Extraction and Colorimetric Estimation of BHA (Butylated Hydroxyanisole)," by Kenzo Toyama, Michio Nakai and Hiroshi Yamaga, article, Nippon Suisan Gakkaishi, vol. 25, 1959-1960, pp. 212-217, printed, Chemical Abstracts, vol. 54, No. 15737e, August 10, 1960.

BACTERIOLOGY:

"Detection and Enumeration of Fecal Indicator Organisms in Frozen Sea Foods. I--*Escherichia Coli*," by H. Raj and J. Liston, article, Applied Microbiology, vol. 9, March 1961, pp. 171-174, printed. Applied Microbiology, Williams and Wilkins Co., Mount Royal and Guilford Aves., Baltimore 2, Md.

BAIT:

"Study on the Bait for Fishing. Part I--An Improved Type of Chum for Yellowtail Fishing," by Takashi Kaneda, Takeo Koyama, and Seinosuke Ishii, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, June 1960, pp. 610-613, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

BIOCHEMISTRY:

"Phosphoglucosomutase, Phosphoribomutase, and Phosphoglucosomerase of Lingcod Muscle," by Gerard-B Martin and H.L.A. Tarr, article, Canadian Journal of Biochemistry and Physiology, vol. 39, February 1961, pp. 297-308, printed. Canadian Journal of Biochemistry and Physiology, Division of Administration, The National Research Council, Sussex St., Ottawa, Canada.

BRAZIL:

A First Appraisal of the Landing and Mechanism of the Santos Fishery, by I. D. Richardson and M. N. de Moraes, 85 pp., illus., printed in English. Universidade de Sao Paulo, Sao Paulo, Brazil, 1960. (Reprinted from Boletim do Instituto Oceanografico, Tomo XI, Fasc. 1, pp. 5-86.) This paper summarizes and analyzes the landing data collected at Santos, Brazil, during the period July 1958-June 1959. These data are given in terms of weight landed of the more important fish and shrimp and also in terms of value. The distribution of the landings of each of the more important species is shown both according to the type of fishing gear used and fishing area. The fishing area is given in the form of statistical rectangles of 60 miles square. The landings are broken down to obtain a figure for the landing per hour of fishing for each species, for each gear, and for each rectangle fished. This figure of landing per unit fishing time is used to compare one area with another, one gear with another, and one month with another for each

of the important species. In this way, comparisons of the available density of a species by time, area, and fishing gear are made.

BROWNING OF FISH FLESH:

"Studies on the Browning of Fish Flesh. II--Change of Sugar Content by Heat Process and Browning," by Fumio Nagayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, October 1960, pp. 1026-1031, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

CALIFORNIA:

The Ecology of the Salton Sea, California, in Relation to the Sportfishery, Fish Bulletin No. 113, 204 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif., 1961.

CANADA:

Journal of the Fisheries Research Board of Canada, vol. 18, no. 5, September 1961, pp. 645-891, illus., printed. Queen's Printer and Controller of stationery, Ottawa, Canada. Contains, among others, the following articles: "Comparative Osteology of Representative Salmonid Fishes, with Particular Reference to the Grayling (*Thymallus arcticus*) and Its Phylogeny," by Carroll R. Norden; "Detection of Incomplete Reporting of Tags," by Gerald J. Paulik; "The Light Pickle Salting of Cod," by P. B. Crean; "The Partial Desalting of Salted Cod," by P. B. Crean; "Chemical Characteristics of Salted Cod," by A. E. Cardin and others; "Effect of Estradiol Monobenzoate on Some Serum Constituents of Maturing Sockeye Salmon (*Oncorhynchus nerka*)," by F. Chung-Wai Ho and W. E. Vanstone; "Fatty Alcohols from Marine Oils and Segregated Esters," by P. M. Janggaard and R. G. Ackman; and "Growth and Age Determination of the Pacific Edible Crab (*Cancer magister* Dana)," by T. H. Butler.

CATFISH:

"Catfishes," by Frank Schwartz, article, Maryland Conservationist, vol. 38, no. 5, September-October 1961, pp. 21-26, illus., printed. Maryland Department of Game and Fish, State Office Bldg., Box 231, Annapolis, Md. Describes catfish in general, then singles out the seven varieties found in various parts of Maryland, giving a description of each. Also covers briefly, the commercial catch of catfish, methods of catching them, and their spawning; and how to catch for sport, dress, and cook catfish.

CLAMS:

Operation Baby Clam in Florida, by Kenneth D. Woodburn, Contribution No. 58, 10 pp., illus., processed. Florida State Board of Conservation Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla. The development of dependable techniques for laboratory culture of seed clams in quantity has spurred interest in the commercial potential of growing baby clams in Florida, where marketable sizes are reached sooner than in northern states. Hybrid and northern hard-shell baby clams are being grown in protective boxes along the Gulf and Atlantic coasts. It is hoped that, when the clams are large enough they can be placed on suitable bottoms, enclosed within screened frames and grown to marketable size.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

COD:

Loss in Weight and Yield of Production after Gutting, Heading, and Filleting Cod on an Industrial Scale, by Jerzy Maciejczyk, OTS 60-21294, 15 pp., illus., processed, 1961. (Translated from Polish *Prace Morskiego Instytutu Rybackiego*, no. 9, 1957, pp. 681-703.) Office of Technical Services, Department of Commerce, Washington 25, D. C., at 50 cents each. Order by OTS number.

"IV. Observations on the Cod Trawl Fishery in the Gulf of St. Lawrence during the Spring of 1958," by John R. Clark and F. D. McCracken, article, *Annual Proceedings, International Commission for the Northwest Atlantic Fisheries*, vol. 8, 1958, pp. 99-100, printed. International Commission for the Northwest Atlantic Fisheries, Forrest Bldg., Carleton St., Halifax, N. S., Canada.

"Slicing of Fillets as an Aid in Detection and Removal of Codworms from Atlantic Cod Fillets," by H. E. Power, article, *Journal of the Fisheries Research Board of Canada*, vol. 18, January 1961, pp. 137-140, printed. *Journal of the Fisheries Research Board of Canada*, Queen's Printer & Controller of Stationery, Ottawa, Canada.

COMPOSITION:

"Fish Composition-Proximate Composition of Nine Species of Sole and Flounder," by Claude E. Thurston, article, *Agricultural and Food Chemistry*, vol. 9, no. 4, July-August 1961, pp. 313-316, printed. *Agricultural and Food Chemistry*, American Chemical Society, 1155 - 16th St. NW., Washington 6, D. C.

"Proximate Composition and Sodium and Potassium Contents of Four Species of Commercial Bottom Fish," by Claude E. Thurston, article, *Journal of Food Science* (formerly *Food Research*), vol. 26, no. 5, 1961, pp. 495-498, printed. *Journal of Food Science*, Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill.

CUBA:

Estudio Bioquímico de la Langosta PANULIRUS ARGUS, I (Biochemical Study of the Spiny Lobster *Panulirus argus*, I), by Eduardo Peon Gonzalez, Note on Investigation No. 3, 64 pp., illus., printed in Spanish. Centro de Investigaciones Pesqueras, Playa Habana, Bauta, Cuba, August 1961.

Segunda Pesca Exploratoria y Datos Biologicos de la Langosta (PANULIRUS ARGUS) en Cuba (Second Exploration and Biological Data for Spiny Lobster, *Panulirus argus*, in Cuba), by Rene J. Buesa Mas, Contribution No. 12, 70 pp., illus., printed in Spanish. Centro de Investigaciones Pesqueras, del Departamento de Pesca del Instituto Nacional de Reforma Agraria, Playa Habana, Bauta, Cuba, May 1961.

CURRENTS:

"Current Measurements from Moored Buoys," by W. S. Richardson, article, *Oceanus*, vol. 8, no. 2, December 1961, pp. 14-19, illus., printed. The Woods Hole Oceanographic Institution, Woods Hole, Mass.

CUTTLEFISH

"Biochemical Studies on the Viscera of Cuttlefish, *Onca mastrephes sloani* Pacificus, V--On the Amylase and Esterase of Viscera," by Takashi Takahashi, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, October 1960, pp. 1006-1009, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

DOLPHINS:

Dolphins: The Myth and the Mammal, by Antony Alpers, 268 pp., illus., by Erik Thorn, printed, \$5. Houghton Mifflin Co., 2 Park St., Boston 7, Mass.

ELECTRICAL FISHING:

"Considerations sur la Pêche au Moyen de l'Electricité" (Regarding Fishing by Means of Electricity), article, *France Pêche*, vol. 6, no. 54, September 1961, pp. 23-26, illus., printed in French. *France Pêche*, Tour sud-est, Rue de Guemene, Boite Postale 179, Lorient, France.

EXPORTS:

Preparing Shipments to the Republic of South Africa, WTIS Part 2, Operations Report No. 61-67, 8 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report giving information on the preparation of shipments for export to the Republic of South Africa. It covers the preparation of shipping documents, information on labeling and marking, customs procedures, and related subjects.

FEEDSTUFFS:

"Animal Body Meals as Protein Feedingstuffs," by H. J. Oslage, article, *Futter und Fütterung* (Supplement to *Der Tierzuechter*), vol. 12, 1961, pp. 44, printed in German. *Futter und Fütterung*, Schweine- und Schweinemast, Grazerstrasse, Hanover-Waldehausen, Zone 20, Germany.

FISH CULTURE:

Bamidegh--Bulletin of Fish Culture in Israel, vol. 12, December 1960, 77 pp., illus., printed in English and Hebrew. Bamidegh--Bulletin of Fish Culture in Israel, Fisheries Department, Ministry of Agriculture, Publication Division, Nir-David, D. N. Israel. Contains these articles: "Suggestions for the Improvement of Fish Breeding," by S. Tal; "New Substances for Control of *Prymnesium*," by S. Sarig and others; "An Electric Instrument for Brandmarking Fish," by Rom Moav and others; "Adaptability of *Tilapia nilotica* to Various Saline Conditions," by Ruth Lotan; "The Elimination of Uncontrolled Spawns in Carp Fattening Ponds," by J. Pruginin and J. Shechter; "A Mobile Belt for Hauling and Sorting Fish," by Z. Shatz.

FISH FLOUR:

"The Manufacture of Fish Flour in South Africa," by G. M. Dreosti and R. P. van der Merwe, *Fishing Industry Research Institute Progress Report No. 64*, article, *The South African Shipping News and*

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Fishing Industry Review, vol. 16, no. 8, August 1961, pp. 50, 63, and 65, printed. The South African Shipping News and Fishing Industry Review, Odhams Press, South Africa (Pty.) Ltd., Box 2598, Cape Town, South Africa. Discusses the history of fish flour in South Africa which started in 1937. Also discusses the technological aspects in the production of fish flour, such as type of fish, solvents, yield of fish flour, factors affecting rate of extraction, method of extraction and related subjects.

FISH MEAL:

"The Available Lysine Content of Fish Meals," by J. Olley and H. Watson, article, Journal of the Science of Food and Agriculture, vol. 12, 1961, p. 316, printed. Journal of the Science of Food and Agriculture, The Society of Chemical Industry, 14 Belgrave Square, London SW 1, England.

"Change of Nitrogenous Substances of Fish Meat in the Preparation of Meal," by K. A. Mrochkov, article, Rybnoe Khoziaistvo, vol. 35, 1958, pp. 131-144, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

(FAO) International Meeting on Fish Meal, CL 35/LIM/3, 5 pp., printed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, June 20, 1961.

"Feed Firm Study Shows Fish Meal Response," article, Feedstuffs, vol. 33, April 15, 1961, pp. 54, printed. Feedstuffs, Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

"Fish Meal," article, Report for 1960 from Fiskeriministeriets Forsogslaboratorium, p. 46, printed in Danish. Fiskeriministeriets Forsogslaboratorium, Copenhagen, Denmark.

"Fish Meal and Today's Feed Industry," by Herbert C. Davis, article, Western Feed and Seed, vol. 16, February 1961, pp. 25-26, printed. Western Feed & Seed, Western States Publications, 320 Market St., San Francisco 11, Calif.

"Fish Meal, Use as Food," by V. C. Metta, article, Journal of the American Dietetic Association, vol. 37, 1960, p. 234, printed. American Dietetic Association, 620 No. Michigan Ave., Chicago 11, Ill.

"Graded Levels of Herring Meal to Bacon Pigs, Effect on Growth Rate, Feed Efficiency, and Bacon Quality," article, Journal of Agricultural Science, vol. 56, 1961, p. 307, printed. Journal of Agricultural Science, Cambridge University Press, 200 Euston Rd., London NW1, England.

"Preservation of Caspian Sprat with Sodium Nitrate for the Manufacture of Fodder Flour," by N. A. Kulikov, article, Rybnoe Khoziaistvo, vol. 35, No. 10, 1959, pp. 65-68, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

FISH SCHOOLS:

"Studies on the Structure of Fish Shoals by Means of Fish Finder. I--Echo Patches of Hair-Tail Observed at the Middle Area of the East China Sea, in February 1959," by Tsuneo Aoyama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, December 1960, pp. 1162-1166, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

FISH SOLUBLES:

"Fish Solubles Experiment Grows Grass on B.C. Highway," by T. Leach, article, Canadian Fisherman, vol. 48, no. 7, 1961, p. 36, printed. Canadian Fisherman, National Business Publications Ltd., Gardenvale, Quebec, Canada.

FOOD:

A Guide to the Selection, Combination, and Cooking of Foods, vol. 1 - Selection and Combination of Foods, by Carl A. Rietz, 411 pp., illus., printed, \$15.00 dom., \$16.00 for. The Avi Publishing Co., Inc., P.O. Box 388, Westport, Conn., 1961. Everyone partakes of food at least three times a day, but our knowledge about foods is very limited. The food behavior of man is the general subject of this book. One of the purposes of this book is to prove that good cooking is "simple." The author states that: "The vast majority of people feed. They do not eat." One of the cardinal premises of the book is that it is not possible for a person to qualify as a judge of food who does not know how to prepare it. The preface points out that cooking, though not an art, is a craft in which the arts have application. It involves discipline in the use of knowledge which has been furnished by many sciences. The more complete the scientific bases of a craft, the more perfect the craft; this generalization applies as well to cookery. Part I indicates a number of sciences which are directly connected with the science of food preparation. Familiarity with the rudiments of such subjects as biology, botany, chemistry, nutrition, pharmacology, physics, physiology, neurology, and psychology are basic for an epicurean cook. The chapters in Part I deal with educational requirements for culinary skills, anatomical and physiological limitations of man, interrelation of taste to other senses, and psychosomatics--what is involved in taste and flavor values. Part II deals with the "Gustametric Master Chart," its method, and its use in food selection. According to the preface, "all foods can be rated according to their flavor intensity, registered on a common logarithmic scaling system." The use of the chart makes it possible to determine quickly and exactly which combinations of foods make for agreeable meals. All types of foods and more than 600 individual foods are covered by the chart. It seems to me this is the first attempt ever made to determine what foods go together and to show a simple method of selecting combinations which are sure to please the average palate. Selection and combination of foods is placed on a scientific basis. In Part II there are chapters on aquatic food or fishery products, meat, poultry, dairy products, vegetables, fruits, beverages, herbs, spices, etc. The chapter on aquatic foods is quite comprehensive and includes sea plants, water fowl, and aquatic mammals. However, since frozen fishery products are increasing in importance, the lack of an extensive discussion on those products is noticeable. The appendix contains a chart on aquatic foods listing those foods according to their technical order and flavor rating intensity on a logarithmic scale. The appendix also includes sections on dry botanicals for beverages, relative sour-

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ness of foods, relative sweetness of wines, flavor appraisal, recommended procedures for packaging foods to be cooked for intrinsic flavor appraisal, and procedures in package cookery. The book has a good index. Anyone engaged in processing, handling, or studying foods will find a good deal of useful information in this book. Of course, anyone who is interested in food for eating pleasure will find the book a valuable addition to his personal library.

--Joseph Pileggi

FOOD AND AGRICULTURE ORGANIZATION

Current Bibliography for Aquatic Sciences and Fisheries, Indexes to Supplement 1, 29 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961. Contains geographic, taxonomic, subject, and citation indexes to references 570001-571944.

FRANCE:

"Les Problemes de la Peche Francaise Face au Marche Commun" (The Problems the French Fisheries Face in the Common Market), article, *France Peche*, vol 6, no. 54, September 1961, pp. 39-48, illus., printed in French. France Peche, Tour sud-est, Rue de Guemene, Boite Postale 179, Lorient, France.

FREEZING:

"The Optimum Conditions for Freezing Fish in an Air Blast," by G. S. Konokotin, article, *Kholodil'naia Tekhnika*, no. 5, 1961, pp. 53-58, illus., printed in Russian. Kholodil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

FRESH-WATER FISH:

A Checklist of the Freshwater Fishes of Canada and Alaska, by W. B. Scott, 30 pp., printed. Royal Ontario Museum, Toronto, Canada.

FROZEN FOOD:

Handling and Merchandising Frozen Food, by F. Miles Sawyer, Thaddeus F. Midura, and Richard M. Vondell, 67 pp., printed. Food Distribution Program, Cooperative Extension Service, Stockbridge Hall, University of Massachusetts, Amherst, Mass., November 1960. A manual prepared to assist State Extension Service personnel in training programs to improve the handling and merchandising of frozen foods, including fish. Major emphasis has been devoted to retail handling. Minor treatment has been given to sections on processing, transportation, and warehousing to provide general background information.

GEAR:

"Top Chafing Gear Studies," by F. D. McCracken, article, *Annual Proceedings, International Commission for the Northwest Atlantic Fisheries*, vol. 9, 1959, pp. 101-103, printed. *Annual Proceedings, International Commission for the Northwest Atlantic Fisheries*, Forrest Bldg., Carleton St., Halifax, N.S., Canada.

GENERAL:

Fishing News International, vol. 1, no. 1, October 1961, 120 pp., illus. printed, annual subscription £1 10s. (US\$4.75). Fishing News International, Arthur J. Heighway Publications, Ltd., 110 Fleet

St., London E. C. 4, England. This quarterly Journal is designed to form a link between the world's fishing industry and those whose task it is to further its development--the oceanographers, marine biologists, technical experts in catching, processing, distribution and management, and the numerous ancillary industries without whose products or services fishing would still be primitive. Will contain authoritative works on proper exploitation of the sea such as different aspects of marine science, modern vessel design and construction, equipment and machinery, reviews of catching techniques, advances and improvements in handling and processing on board, in factories, etc. This first issue contains a number of articles on the various aspects of commercial fisheries. Included are the following: "Science in Fisheries," by Editor in Chief, Arthur J. Heighway; "Freedom from Hunger," by D. B. Finn; "Preservation by Antibiotics, Part I," by H. L. A. Tarr; "International Conferences;" "Fisheries of Mainland China," by E. F. Szezepanik; "Examination of Stern Trawling," by Conrad Birkhoff; "Common Policy in the Common Market," by P. Hovart; "Reorganizing Tunisia's Fishing Industry," by Mary R. Bull; "Handling of the Catch, Part I," by Jan F. Minnee; and "Accelerated Freeze Drying in Fish Processing," by Enid A. M. Bradford.

Life in the Sea, by Gosta Jagersten, photographs by Lennart Nilsson, 184 pp., printed, 50s. (US\$7.00), G. T. Foulis and Co., Ltd., London, England, 1961. A book of photographs, a few in color but mainly black-and-white, of marine invertebrates and a few fish.

A Report of Data Obtained in Florida Straits and off the West Coast of Florida July-December 1960, 111 pp. illus., processed. The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

GERMAN FEDERAL REPUBLIC:

Allgemeine Fischwirtschafts-Zeitung, Fachheft-Export, Special Technical Issue No. 34, August 26, 1961, printed in German and English. Verlag Carl Th. Gorg, Am Sorgfeld 110, Hamburg-Blankenese, German Federal Republic. A special issue dealing primarily with the export situation in Germany. Contains, among others, the following articles: "Export Prospects in the Wider Market," by Karl Kuhne; "The Importance of Germany's Food Export Economy with Particular Regard to the Fish Economy," by von Albert M. Groening; "The Fish Economy Trade of the EEC Countries," by Margot Krohn; "The Situation in the Exportation Domain Concerning Fresh Fish, Quick Frozen Fish, and Fish By-products;" "Last Product of German Fishery: The Frozen Fish," by E. G. Rudolphi; and "The Export of Salt Fish," by Erich Dehl.

GREECE:

Import Tariff System of Greece, WTIS Part 2, Operations Report No. 61-68, 2 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on units of currency, weights, and measures; import regula-

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tions; bases of specific and ad valorem duties; customs duties and surtaxes; sales and other internal taxes; and consular documents and fees.

HALIBUT:

Bering Sea Halibuts, by N. P. Novikov, Translation Series No. 329, 4 pp., processed. (Translated from the Russian, *Rybnoe Khoziaistvo*, vol. 36, no. 1, pp. 12-15, 1960). English translations available from the Fisheries Research Board of Canada Biological Station, Nanaimo, B. C., Canada.

HERRING:

"The Liquefaction of British Columbia Herring by Ensilage, Proteolytic Enzymes and Acid Hydrolysis," by J. R. McBride, D. R. Idler, and R. A. Macleod, article, *Journal of the Fisheries Research Board of Canada*, vol. 18, 1961, p. 39, printed. *Journal of the Fisheries Research Board of Canada*, Queen's Printer & Controller of Stationery, Ottawa, Canada.

"Preparation of Marinated Herring Using Lactic Acid," by H. Houwing, article, *Conserva*, vol. 8, 1960, pp. 252-253, printed in Dutch. *Maanblad voor de Voedings- en Genotmiddelen-Industrie*, Moormans Periodieke Pers N. V., The Hague, Netherlands.

"Un Rideau de Bulles d'Air Auxiliaire de la Pêche au Hareng," (Fishing for Herring with Aid of Air-Bubble Curtain), article, *France Pêche*, vol. 6, no. 54, September 1961, pp. 15-17, 19-22, illus., printed in French. *France Pêche*, Tour sud-est, Rue de Gueumene, Boite Postale 179, Lorient, France.

INTERNATIONAL COMMISSIONS:

(International North Pacific Fisheries Commission) *Statistical Yearbook*, 1960, 67 pp., illus., printed. International North Pacific Fisheries Commission, 6640 NW Marine Dr., Vancouver 8, B.C., Canada. A statistical summary covering the salmon fishery in Canada, Japan, and the United States; herring fishery in Canada and the United States; halibut fishery along the coast of the North American west coast; and the king crab fishery in the Eastern Bering Sea during 1960. Statistical tables cover landings of salmon, herring, halibut, and king crab; and salmon and king crab packs.

IRAN:

Licensing and Exchange Controls--Iran, WTIS Part 2, Operations Report No. 61-66, 11 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington 25, D. C., September 1961. Outlines Iran's import and exchange controls (general and special provisions, prohibited imports, and commercial profits tax); Iran's export controls and United States controls (exports, imports, and other controls). Includes list of prohibited import goods and list of goods subject to commercial profits tax (by tariff chapters).

ITALY:

"Fenomeni Alternativi del Pesce e Metodi Chimici per il Loro Riconoscimento" (Fish Spoilage and Chemical Methods for Recognizing It), by Antonio Montefredine and Concetta Testa, article, *Bollettino di Pesca, Piscicoltura e Idrobiologia*, vol. 15, Jan-

uary-June 1961, pp. 48-135, printed in Italian with summary in English. *Bollettino di Pesca, Piscicoltura e Idrobiologia*, Laboratorio Centrale di Idrobiologia, 91 Piazza Borghese, Rome, Italy.

JAPAN:

Progress Report of the Cooperative Investigations on Important Neritic-Pelagic Fisheries Resources 1956-1957, 320 pp., illus., printed in English and Japanese. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

KOREA:

Annual Report of the Central Fisheries Experiment Station, No. 1, 89 pp., illus., printed in Korean with summary in English. Central Fisheries Experiment Station, Pusan, Korea, 1960. Discusses the history and organization of the Central Fisheries Experiment Station, research and surveys of 1960, and contains a list of research vessels. A list of past publications is also included.

Bulletin of the Central Fisheries Experiment Station, No. 1--Processing and Food Technology, 138 pp., printed in Korean with summaries in English. Central Fisheries Experiment Station, Pusan, Korea, 1960. Contains, among others, the following articles: "Studies on the Chemical Change in Frozen Oyster and Shrimp during Cold Storage," by Bong Nai Lee and others; "Studies on the Improvement of the Salted Products. I--Influence of the Freshness of Raw Fish and the Quality of Salts Affecting in the Salted Fish; and II--Effectiveness of Chlorotetracycline and Salting Methods for Keeping Quality of the Salt Cured Products," by Sang Ho Shin and Jai Hyung Byun; and "Experiment to Increase the Yield of Agar-Agar," by Nam Ki Paek.

MARINE BACTERIA:

"Marine Bacteria and their Taxonomy," by John Liston and Rita R. Colwell, Contribution 116, article, *Research in Fisheries 1960*, pp. 18-20, printed. College of Fisheries, University of Washington, Seattle 5, Wash., March 1961.

MARINE PLANTS:

Marine Plant Resources of British Columbia, by Robert F. Seagel, Bulletin No. 127, 50 Canadian cents. The Queen's Printer and Controller of Stationery, Ottawa, Canada.

MARKING FISH:

"There's More Than One Way to Leave a Mark on Life," by Keen Buss, article *Pennsylvania Angler*, vol. 30, no. 10, October 1961, pp. 1-5, illus., printed. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Describes methods of marking fish which aids the biologist to determine movement, age and growth, population densities, and other habits of fish.

NAVIGATION:

United States Coast Pilot 3--Atlantic Coast, Sandy Hook to Cape Henry, Seventh Edition, 204 pp., printed, \$2.50. U. S. Department of Commerce, Coast and Geodetic Survey, Washington 25, D. C., 1961. A nautical book containing a wide variety of information important to navigators. Subjects include landmarks, navigation regulations, channels, anchorages,

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dangers, weather, ice, routes, pilotage, and port facilities. Most of the information in the book cannot be shown conveniently on the standard nautical charts. The book is corrected through Notice to Mariners 24 of June 17, 1961.

NETHERLANDS:

Jaarcijfers over de Visserij Gedurende Het Jaar 1960 (Annual Fisheries Statistics, 1960), No. 52, 168 pp., illus., printed in Dutch with summaries in English, and statistical tables in both Dutch and English. Directie van de Visserij, 's-Gravenhage, Netherlands, 1961.

NETS:

"The Development of German Driftnets for Salmon and the Test of New Types of Nets," by F. Thurow, article, Das Fischerblatt, vol. 7, 1959, pp. 197-201, printed in German. Das Fischerblatt, Landesfischerei-Verband Schleswig-Holstein, 108 Holstenstrasse, Kiel, Germany.

"Influence of Waves Against Behavior of the Double Drift Net in the Waters, the Case When the Net is put Parallel with Running Wave Direction," by Masatsune Nomura, Keishiro Mori, and Hajime Taketomi, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, June 1960, pp. 576-576, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kai-gandori, Minato-Ku, Tokyo, Japan.

NEW ZEALAND:

Report on Fisheries for 1960, 23 pp., printed. R. E. Owen, Government Printer, Wellington, New Zealand. This report contains statistical data on fisheries for the calendar year 1960. Includes, among others, data containing estimated total quantities and values of the principal classes of fishery products marketed in 1960; and annual totals for the most important group of fish (wet fish) for years 1941-1950; the fishery for crayfish; fishing vessels and personnel; methods of capture; exports and imports; whaling; research and investigation; legislation on fisheries; etc.

NORWAY:

"Fiskefartoyers Lonnsomhet i 1959--Sesongresultater" (Fishing Vessel Profits in 1959--Annual Results), article, Fiskets Gang, vol. 47, no. 30, July 27, 1961, pp. 527-532, printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

NUTRITION:

"The Assessment of Nutritive Value in Protein Concentrates by the Gross Protein Value Method," by J. Duckworth, A. A. Woodham, and I. McDonald, article, Journal of the Science of Food and Agriculture, vol. 12, 1961, p. 407, printed. Journal of the Science of Food and Agriculture, The Society of Chemical Industry, 14 Belgrave Square, London SW1, England.

"Fat Absorption during the First Year of Life in Prematurely Born Children after Administration of Different Amounts of Fish Oil," by V. Ya. Vashchilko, Fiziol. Osobennosti Detsk Vozrasta i Voprosy Profilaktiki Zabolevani (Kharkov) Sbornik, 1959, pp.

93-100. Chemical Abstracts, vol. 55, No. 3747d, February 20, 1961.

Fish and Your Health, 2 pp., folder, illus., printed. U. S. Bureau of Commercial Fisheries, Southwest Area Marketing Office, 4232 Herschel Ave., Dallas 19, Texas. The tremendous interest all over the United States in polyunsaturated and saturated fats, cholesterol control, heart disease, etc., has prompted the issuance of a timely and useful leaflet, outlining the role of fish in diets for control of blood cholesterol levels, polyunsaturation, and use of oily and non-oily fish in the diet.

Forget Birthdays. . . Enjoy Good Eating, 2 p. folder, illus., printed single copy 3 cents (in quantities of 50--\$1.25; 100--\$2.00). The American Dietetic Association, 620 No. Michigan Ave., Chicago 11, Ill., September 1961. Contains facts regarding daily dietary requirements, the necessity for three well-planned meals a day, and the way to form good eating habits. The daily meal plans shown in the pamphlet all include fish.

"Nutritive Value of Maine Sardines. II--Animal Feeding Tests," by S. A. Miller and others, article, Journal of Nutrition, vol. 74, 1960, p. 70, printed. Journal of Nutrition, American Institute of Nutrition, 36th Street at Spruce, Philadelphia 4, Pa.

OCEANOGRAPHY:

Investigations of Inner Continental Shelf Waters Off Lower Chesapeake Bay, Part II. Sand Lance Larvae, AMMODYTES AMERICANUS, by John J. Norcross, and others, contribution No. 96, 9 pp., illus., printed. (Reprinted from Chesapeake Science, vol. 2, no. 1-2, March-June 1961.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

A Technical Report Bathymetric Reconnaissance of of Exhuma Sound, by Violet B. Seigler, 36 pp., illus., processed. The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

O.E.C.D.:

"Development Aid Accented as O.E.C.D. Comes Into Existence," article, Foreign Commerce Weekly, vol. 66, no. 18, October 30, 1961, pp. 5-6, printed, single copy 30 cents. U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the reconstitution of the Organization for European Economic Cooperation (O.E.E.C.) which was organized in April 1948 to administer Marshall Plan aid and to restore the European economy on a cooperative basis, to the newly-established Organization for Economic Cooperation and Development (O.E.C.D.). The new organization will take over two of the main aspects of O.E.E.C.'s work, the study of trade problems and of economic expansion, but on a scale which will include the North American countries. Will also aid in developing countries outside confines of Organization's membership, i.e. the newly-emerging nations of Africa and Asia.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

OYSTER DRILLS:

Sexual Behavior of the Oyster Drills: EUPLEURA CAUDATA and UROSALPINX CINEREA, by William J. Hargis, Jr., and Clyde L. Mackenzie, Jr., Contribution No. 100, 11 pp., illus., printed. (Reprinted from *Nautilus* vol. 75, no. 1, July 1961, pp. 7-16.) Virginia Fisheries Laboratory, College of William and Mary, Gloucester Point, Va.

OYSTERS:

Mass Culture of Phytoplankton as Foods for Metazoans, by Harry C. Davis and Ravenna Ukeles, article, 2 pp., illus., printed. (Reprinted from *Science*, vol. 134, no. 3478, August 1961, pp. 562-564.) American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C.

Prospectus on Oyster Rehabilitation for the Hillsborough County Port Authority, by K. D. Woodburn, 8 pp., processed. Director of Research, Florida State Board of Conservation, W. V. Knott Building, Tallahassee, Fla.

PACKAGING:

Vacuum Packaging as a Means for Prolonging the Storability of Smoked Herring Fillets, by M. von Schelhorn, 2 pp., printed. Jahresbericht über die Deutsche Fischwirtschaft, Berlin, Germany, 1957.

PLANKTON:

Investigations of Inner Continental Shelf Waters of Lower Chesapeake Bay. Part III. The Phorozooid Stage of the Tunicate DOLIOLUM NATIONALIS, by Robert M. Terry, contribution No. 99, 4 pp., illus., printed. (Reprinted from *Chesapeake Science*, vol. 2, no. 1-2, March-June 1961.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

The Oceanic and Bathypelagic Plankton of the North-East Atlantic, and its Possible Significance to Fisheries, by J. H. Fraser, Marine Research No. 4, 48 pp., illus., printed, 16s. 0d. (US\$2.24). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1961.

PORTUGAL:

Gremio dos Armadores da Pesca de Arrasto, Relatório e Contas do Exercício de 1960 e Orçamento para 1961 (Trawler Owners' Guild, Statement of Operations for 1960 and Budget for 1961), 36 pp., illus., printed in Portuguese. Comissão Revisora de Contas, Lisbon, Portugal, March 15, 1961.

PROTEIN:

"The Quality of Fish Flour, Liver Meal, and Visceral Meal as Sources of Dietary Protein," by B. A. Larsen and W. W. Hawkins, article, *Journal of the Fisheries Research Board of Canada*, vol. 18, 1961, p. 85, printed. *Journal of the Fisheries Research Board of Canada*, Queen's Printer & Controller of Stationery, Ottawa, Canada.

RHODESIA:

The Fishes of Northern Rhodesia, by P. B. N. Jackson, printed, 7s. 6d. (about US\$1.05). The Government Printer, P. O. Box 136, Lusaka, Northern Rhodesia. This book deals with every fish known from Northern Rhodesia except those of Lake Tanganyika. It is a checklist of that area, providing a key to identification of species, a description of each fish,

and a wealth of valuable information on their ecology and habits.

RED TIDE:

Red Tide Studies, Final Report 57-18, 24 pp., illus., processed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., July 1957.

SALMON:

"The Elusive Salmon," article, *World Fishing*, vol. 10, April 1961, pp. 73-74, printed. John Trundell (Publishers) Ltd., St. Richard's House, Eversholt St., London, NW 1, England.

SCALLOPS:

Scallop Investigation, Tasman Bay 1959-60, by J. H. Choat, Fisheries Technical Report No. 2, 51 pp., processed. New Zealand Marine Department, Wellington, New Zealand.

SEAWEEDS:

Recovery of Swelling Agents from Seaweeds, by Tjoa S. Lian, German Patent No. 1,021,696, December 27, 1957. Deutsches Patentamt, Zeibucken, Strasse 12, Munich 2, Germany.

SHAD:

A Potomac River Shad Fishery, 1814-1824, by William H. Massmann, Contribution No. 98, 6 pp., illus., printed. (Reprinted from *Chesapeake Science*, vol. 2, no. 1-2, March-June 1961.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

SHRIMP:

Biological Observations on the Commercial Shrimp, PENAUS DUORARUM Burkenroad, in *Florida Waters*, by Bonnie Eldred and others, Professional Papers Series No. 3, 139 pp., illus., printed. Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Fla. This report results from comprehensive studies that have been under way since 1955. Discusses methods and equipment used in the survey; Tampa Bay area monthly shrimp stations; Tortugas controlled area sampling; sex size disparity, ratio and sexual development of shrimp; and migration and sexual maturity. Also discusses the relation of temperature to distribution, spawning, and population densities; behavior, diet, growth, and parasites; incidental samples of *P. duorarum* from Florida waters; and commercial offshore shrimp catch (*P. duorarum*) from west coast of Florida.

Maturation and Spawning of the Pink Shrimp, PENAUS DUORARUM Burkenroad, by William C. Cummings, Contribution No. 328, 7 pp., illus., printed. (Reprinted from *Transactions of the American Fisheries Society*, vol. 90, no. 4, October 1961.) *Transactions of the American Fisheries Society*, Librarian, Colorado A. and M. College, Fort Collins, Colorado.

Notes on the Caridean Shrimp, RHYNCHOCINETES RIGNES Gordon (CRUSTACEA, DECAPODA), in the Western Atlantic, by Raymond B. Manning, Contribution No. 334, 7 pp., illus., printed. (Reprinted from *Notulae Naturae*, no. 348, November 10, 1961.) *Notulae Naturae*, The Academy of Natural Sciences of Philadelphia, Philadelphia, Pa.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Turning Shrimp Waste into Profit," article, Norwegian Fishing and Maritime News, vol. 7, no. 1, 1960, p. 17, printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

SMALL BUSINESS MANAGEMENT:

Pointers on Meeting Competition, by Edward C. Bursk, Management Aids for Small Manufacturers No. 134, 4 pp., processed. Small Business Administration, Washington 25, D. C., November 1961. This report discusses pointers on meeting competition in business. Certain elements in today's economy such as automation, statistical decision-making, and the cost-price squeeze tend to force the large business into a pattern of standardization. Despite predictions to the contrary, these same conditions can bring new opportunities to small businessmen prepared to capitalize on them. He can retain his adaptability, and be in a good position to pick up opportunities that must be bypassed by his larger competitor.

Understanding Why They Buy, by Bertrand Klass, Small Marketers Aid No. 73, 4 pp., processed. Small Business Administration, Washington 25, D. C., November 1961. A report designed to tell small marketers what "motivation research" is and what it can mean to their businesses was issued recently by the Small Business Administration. Why customers buy as they do is an important question for small business owners and managers. Finding answers is often far from easy. But more and more businessmen are trying to find answers, and many are seeking scientific help in getting reliable ones. Some even feel that a really effective merchandising approach cannot be planned without knowing what makes customers buy--in other words, without "motivation research." The author recognizes that small marketers rarely engage in doing motivation research themselves, but suggests that they may be able to use the results of studies conducted by big concerns to merchandise their products. In this way, the small marketer can better organize and direct his selling efforts.

SMOKED FISH:

"The 3, 4-Benzopyrene Content of Fish Smoked by Different Processes," by N. D. Gorelova and others, article, Voprosy Onkol, vol. 6, No. 1, 1960, pp. 33-37, printed in Russian. Chemical Abstracts, vol. 55, No. 4814h, March 6, 1961.

SOUTH AFRICA REPUBLIC:

Import Tariff System of Republic of South Africa, WTIS Part 2, Operations Report No. 81-65, 4 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on units of currency, weights, and measures; import regulations; bases of specific and ad valorem duties; customs duties and surtaxes; sales and other internal taxes; and consular documents and fees.

Marine Studies off the Natal Coast, C.S.I.R. Symposium No. S2, 134 pp., illus., printed. The South African Council for Scientific and Industrial Research,

P. O. Box 395, Pretoria, South Africa, March 1961. A symposium on marine studies off the Natal Coast was arranged to review the present state of knowledge and to assess the more urgent needs for research. This report contains papers on "Origin and Development of the Natal Coast," "Meteorological Aspects, Especially Surface Winds and Associated Weather Along the Natal Coast," "The Nearshore Circulation of Water," "Bathymetric and Hydrographic Aspects of Marine Studies off the Natal Coast," "The Use of Drift-Cards to Deduce Currents Along the Natal Coast," "The Nearshore Movement of Sand at Durban," "Some Aspects of Offshore Whaling," "Intertidal and Estuarine Fauna," "A Quantitative Assessment of the Effects of Factory Effluent Upon Littoral and Estuarine Faunas at Umkomaas," "Shark Research in Natal," "Fisheries Research in Natal Waters," and "Basic Model Studies of Nearshore Wave Action."

SPAIN:

"La Gamba del Golfo de Cadiz y Marruecos" (The Shrimp of the Gulf of Cadiz and Morocco), article, Puntal--Revista Maritima y Pesquera, vol. 8, no. 89, pp. 16-21, illus., printed in Spanish. Puntal--Revista Maritima y Pesquera, Ramon y Cajal 3, Apartado 316, Alicante, Spain.

La Pesca Espanola en 1960 (The Spanish Fisheries in 1960), article, Boletin de Informacion del Sindicato Nacional de la Pesca, nos. 34-35, July-August 1961, pp. 13-19, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, Madrid, Spain.

SPONGES:

"Antimicrobial Substances from Sponges," by Sophie Jakowska and Ross F. Nigrelli, article, Annals of the New York Academy of Science, vol. 90, Art. 3, 1960, pp. 913-916, printed. New York Academy of Science, 2 E. 63rd St., New York 21, N.Y.

"Contributions to the Study of Marine Products. L--Phospholipids of Sponges," by Robert A. Landowne and Werner Bergmann, article, Journal of Organic Chemistry, vol. 26, April 1961, pp. 1257-1261, printed. Journal of Organic Chemistry, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Nucleic Acids of Sponges," by Martin F. Stempien, Jr., article, Annals of the New York Academy of Science, vol. 90, Art. 3, 1960, pp. 910-912, printed. New York Academy of Science, 2 E. 63rd St., New York 21, N.Y.

STARFISH:

"Confirmation of Saponin as a Toxic Principle of Starfish," by Yoshiro Hashimoto and Takeshi Yasumoto, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, November 1960, pp. 1132-1138, printed in Japanese and English. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

STORAGE:

"French Tests on the Pre-Storage of Sardine on Board Fishing Boats by Cooling in Sea Water at -0°C," article, Rev. Conserve, vol. 15, May-June 1960, pp. 130-131, printed in French. Rev. Conserve, Societe d'

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Edition pour l'Alimentation, 1 Rue de la Real, Paris, France.

STORAGE LIFE:

"Studies on the Evaluation of Freshness and on the Estimation of the Storage Life of Raw Fishery Products," by Lionel Farber and Peter Lerke, article, *Food Technology*, vol. 15, April 1961, pp. 191-196, printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

STRIPED BASS:

Movements of Striped Bass Tagged in Virginia Waters of Chesapeake Bay, by William H. Massmann and Anthony L. Pacheco, Contribution No. 97, 7 pp., illus., printed. (Reprint from *Chesapeake Science*, vol. 2, no. 1-2, March-June 1961, pp. 37-44.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

TIDEWATER FISHERIES:

Department of Tidewater Fisheries: What It Is, What It Does, 36 pp., printed. Tidewater Fisheries Commission, State Office Bldg., Annapolis, Md. A report of the Department of Tidewater Fisheries with statements about its organization and activities from the reorganization July 1, 1959, to December 1, 1960. Discusses, among others, the oyster propagation program, soft-shell clams, and finfish and crab program.

TRADE LISTS:

The Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade list. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$1 each.

Canneries and Frozen Food--Producers and exporters--Egyptian Region of United Arab Republic, 3 pp. (October 1961). Lists names and addresses, size of firms, and types of products handled by each firm. Includes fish canneries, and producers and exporters of frozen shrimp and sardines.

TRASH FISH:

Preservation of Trash Fish, by William Saenz and D. L. Dubrow, Marine Fisheries Research Report, Special Service Bulletin No. 17, 5 pp., processed. Marine Laboratory, Institute of Marine Science of the University of Miami, Virginia Key, Miami 49, Fla. (Available from Florida State Board of Conservation, Tallahassee, Fla.) A simple and inexpensive method for the preservation of "trash fish" on board vessels is described. This method involves converting the trash into liquid fish and stabilizing it in an acid medium. The resulting slurry can be converted into fertilizers, animal foods, purified chemical foods, and fish meal.

TRAWLERS:

"A German Stern Trawler with Novel Winching Arrangements," article, *World Fishing*, vol. 10, May 1961, p. 62, printed. John Trundell (Publishers) Ltd., St. Richard's House, Eversholt St., London, NW1, England.

TROUT:

Movements and Growth of Spotted Seatrout, CYNO-SCION NEBULOSUS (Cuvier), in West Florida, by Alan W. Moffett, Technical Series No. 36, 35 pp., illus., printed. The Marine Laboratory, Institute of Marine Science of the University of Miami, Virginia Key, Miami 49, Fla., May 1961. (Available from Florida State Board of Conservation, Tallahassee, Fla.) This report covers a description of the spotted sea trout fishery, materials and methods, tag releases, movements, growth, and spawning. The small amount of movement observed between tagging areas suggests that a series of nearly isolated groups of spotted sea trout exist on the west coast of Florida. Connection is maintained between these groups because of a few fish which make longer movements. However, for the purposes of fishery management the areas may be considered separate, and regulations made affecting one area would have little effect in other areas. The decline of commercial landings of spotted sea trout in Florida, which began in 1952, reached a low in 1955 but since have increased. This suggests that the cause may have been cyclical. At present, there is no information to indicate that spotted sea trout on the west coast of Florida are being overexploited.

TUNA:

"Observations on 'Green' Tuna," by A. M. Dollar and others, article, *Food Technology*, vol. 15, no. 5, 1961, pp. 253-255, printed. Food Technology, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

"Tagging and Recovery of Tropical Tunas, 1955-1959," by Milner B. Schaefer, and others, *Inter-American Tropical Tuna Commission Bulletin*, vol. 5, no. 5, 111 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif.

TURKEY:

"Balik Endustrimizi Gelistirmek için Fon" (ICA Fund to Develop Our Fishing Industry), by Suleyman Arisoy, article, *Türkiye İktisat Gazetesi*, no. 430, June 22, 1961, p. 5, printed in Turkish. Odalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Balıkçılık Kooperatiflerimizin Reorganizasyonu" (The Reorganization of Our Fishing Cooperatives), by Suleyman Arisoy, article, *Türkiye İktisat Gazetesi*, no. 416, March 9, 1961, p. 4, printed in Turkish. Odalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Dunyada Aclikla Mucadele Kampanyasi ve Türkiye Balıkçılığı" (Turkey's Fisheries and Freedom from Hunger Campaign "FFHC") by Suleyman Arisoy, article, *Türkiye İktisat Gazetesi*, no. 424, May 4, 1961, p. 4, printed in Turkish. Odalar Birliği Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Prof. Baade Raporuna Gore Balıkçılıgimiz ve Beslenme Imkanlarimiz" (Our Nutrition Possibilities and Our Fisheries in the Light of Prof. Baade's Report), by Suleyman Arisoy, article, *Türkiye İktisat Gazetesi*, no. 403, December 8, 1960, p. 5, printed in Turkish. Odalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

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"Prof. F. Baade'ye Gore 1975 Yilinda Turkiyenin Gida Problemive Balıkcılıgımız" (Nutrition Problems and Turkish Fisheries in 1975 according to Prof. Baade's Report), by Suleyman Arisoy, article, *Turkiye İktisat Gazetesi*, no. 437, August 10, 1961, p. 5, printed in Turkish. Okalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Turk Standartları Enstitüsü (TSE) Kanununun Kabulü Dolayısıyla Dünyada ve Türkiye'de Balık Endüstrisi Mamullerinin Standardizasyonu" (The Standardization of Fish Processing in Turkey and the World in the Light of the Act of Turkish Standardization Institute "TSE"), by Suleyman Arisoy, article, *Turkiye İktisat Gazetesi*, no. 404, December 15, 1960, p. 5, no. 405, December 22, 1960, p. 5, printed in Turkish. Odalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Türkiye Balık Ekonomisinin Gelişmesinde T. C. Ziraat Bankası Mufettislerinin Vazife ve Mes'uliyeti" (Duties and Responsibilities of Inspectors of the Agricultural Bank of the Turkish Republic in the Development of the Turkish Fisheries Economics), by Suleyman Arisoy, article, *Turkiye Cumhuriyeti Ziraat Bankası Teftiş Bülteni*, vol. 3, nos. 31, 32, 33, July-September 1960, pp. 20-25, printed in Turkish. T. C. Ziraat Bankası Matbaası, Ankara, Turkey.

--Listings under Turkey supplied by Suleyman Arisoy, Fisheries Advisor, Agricultural Bank of the Turkish Republic, Ankara, Turkey.

U.S.S.R.:

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE FISHERIES RESEARCH BOARD OF CANADA BIOLOGICAL STATION, NANAIMO, B. C.

Commercial Fishes of the Anadyr River and the Anadyr Estuary, by A. G. Kaganovski, Translation Series no. 282, 5 pp., processed. (Translated from the Russian, *Vestnik Dalnevostochnovo Filiala Akademii Nauk SSR* for 1933, No. 1-3, pp., 137-139, 1933, Vladivostok).

VIET NAM:

Licensing and Exchange Controls--Viet-Nam, WTIS Part 2, Operations Report No. 61-69, 6 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington 25, D. C., September 1961. This report discusses the import and export controls of Viet Nam, and United States import and export controls.

WASHINGTON:

1960 Fisheries Statistical Report, by Robert Robison, Dale Ward, and Arthur Palmen, 94 pp., illus., printed. Washington State Department of Fisheries, 4015 20th Ave., W., Seattle 99, Wash., 1961. Contains statistical data on salmon landings in the Puget Sound, Grays Harbor, Willapa Harbor, and Columbia River Districts; bottomfish landings; oyster production; and shellfish landings in the Puget Sound and Grays Harbor Districts. Also covers the Indian fisheries; fishway counts at the various dams in the State of Washington; and related subjects.

WHALE OIL:

"The Absorption Spectrum of the Molecular Distillation Residue of Whale-Liver Oil," by Yoshimori Omote, article, *Nippon Kagaku Zasshi*, vol. 80, 1959, pp. 804-805. *Chemical Abstracts*, vol. 55, No. 3093i, February 6, 1961.

WHALES:

"Studies on Whale Lipase. I--Lipase of the Pancreas of Little Finner," by Yoshio Ishihara, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 11, May 1960, pp. 23-28, printed in Japanese. Bulletin of the Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

CHANGE OF ADDRESS

In the November 1961 issue, page 88, article "Commercial Application of Accelerated Freeze-Drying," the address of the National Business Publications, Ltd. (publisher of the *Canadian Refrigeration and Air-Conditioning Journal*) has been changed to Gardenvale, Quebec, Canada.



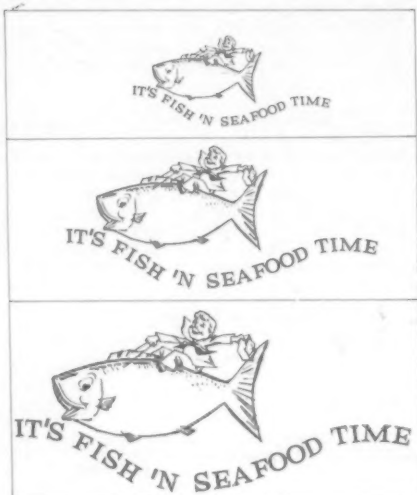
HEAT PENETRATION IN CANNING FISHERY PRODUCTS DEPENDS ON SIZE OF PARTICLES

The size of the particles into which a canned product is divided has considerable effect on the rate of heat penetration. For example, shrimp will heat through to the center more rapidly than salmon because a can of shrimp contains a large number of small pieces and salmon one or two large pieces.

--Principles and Methods in the Canning of Fishery Products, Research Report No. 7 (page 21), U. S. Fish and Wildlife Service.

"IT'S FISH 'N SEAFOOD TIME," MARCH 7-APRIL 22

The commercial fishing industry's Lenten promotion this year will take place March 7-April 22. Food stores are urged to use the emblem shown as a masthead in their newspaper ads. Restaurants are asked to feature the emblem on their menus.



News releases together with pictures of fish dishes will appear in newspapers and magazines throughout the Lenten period. Radio and television programs are also planned. Processors and packers of fishery products as well as other segments of the fishing industry will be doing extensive advertising in all media.

The National Fisheries Institute states that restaurant and eating-out magazines will be furnished articles and photographs of suggested fish 'n seafood dishes for their food pages. In addition, there will be advertisements for the Halibut Association of North America, the National Shrimp Breaders Association, and the Shrimp Association of the Americas in the same magazines. Individual fishery firms also will be running ads.

The U. S. Bureau of Commercial Fisheries is cooperating with the commercial fishing industry in its industry-wide Lenten Promotion. The Bureau has developed and distributed a variety of educational and information materials for use during the Lenten promotion. In addition, Bureau marketing specialists and home economists will be appearing on radio and television. Bureau materials will stress menu variety, ease of preparation, nutritional value, and other health benefits in using fish and shellfish in the diet.

